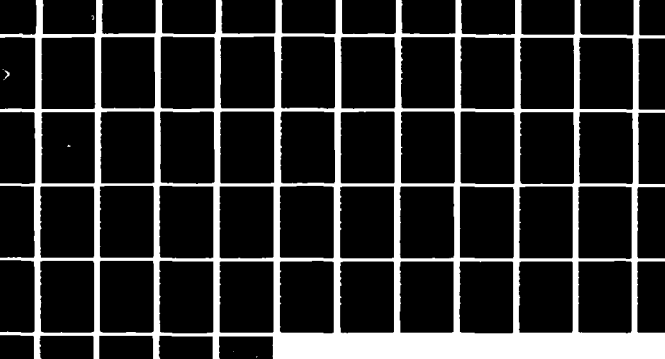
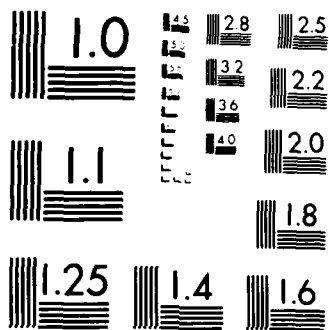


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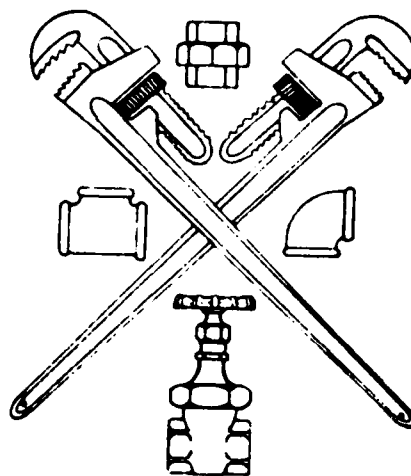
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UNITED STATES AIR FORCE

OCCUPATIONAL SURVEY REPORT



PLUMBING CAREER LADDER

AFSC 552X5
AND
OCCUPATIONAL SERIES WG-4206

AFPT 90-552-752

DECEMBER 1987

OCCUPATIONAL ANALYSIS PROGRAM
USAF OCCUPATIONAL MEASUREMENT CENTER
AIR TRAINING COMMAND
RANDOLPH AFB, TEXAS 78150-5000

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PREFACE

This report presents the results of a detailed Air Force Occupational Survey of the Plumbing career ladder (AFSC 552X5). Authority for conducting occupational surveys is contained in AFR 35-2. Computer products upon which this report is based are available for use by operations and training officials.

The survey instrument was developed by Mr William C. Cosgrove, Inventory Development Specialist, with computer programming support furnished by Ms Rebecca Hernandez. Administrative support was provided by Ms Anita R. Carter. Mr Robert L. Alton, Occupational Analyst, analyzed the data and wrote the final report. This report has been reviewed and approved by Lt Col Thomas E. Ulrich, Chief, Airman Analysis Branch, Occupational Analysis Division, USAF Occupational Measurement Center.

Copies of this report are distributed to Air Staff sections, major commands, and other interested training and management personnel. Additional copies are available upon request to the USAF Occupational Measurement Center, Attention: Chief, Occupational Analysis Division (OMY), Randolph AFB, Texas 78150-5000 (AUTOVON 487-6623).

RONALD C. BAKER, Colonel, USAF
Commander
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Center

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Center

SUMMARY OF RESULTS

1. Survey Coverage: The Plumbing career ladder was surveyed to obtain current data for use in training management decisions. Survey results are based on responses from 1,240 military personnel (70 percent of all assigned 3-, 5-, and 7-skill level 552X5 career ladder personnel) and 257 WG-4206 civilian personnel (45 percent of those available for survey). All major using commands are well represented in the total sample of 1,497 combined military and civilian personnel.
2. Specialty Jobs: Two clusters and five independent jobs were identified in the analysis. One cluster and two independent jobs were directly involved in the performance of various technical duties of the career ladder. The remaining cluster and independent jobs were oriented toward supervisory, training, planning, and contingency activities.
3. Career Ladder Progression: The 3- and 5-skill level jobs were highly technical, with very little responsibility for supervision or management. Seven-skill level members, although reporting a responsibility for and performing supervision, were also performing a job that was still somewhat technically oriented.
4. AFR 39-1 Specialty Descriptions: All descriptions accurately depict the nature of the respective jobs. Only one minor adjustment is suggested in the Plumbing Specialist description.
5. Training Analysis: The Specialty Training Standard (STS) is generally well supported by survey data, with just a few elements requiring review due to nonsupporting survey data. The POI has four units of instruction with some objectives which require review due to the low percentage of first-term airmen performing tasks trained. Some tasks not matched to these training documents require evaluation for possible inclusion in the training program.
6. Implications: The training program is well grounded and appears to be operating effectively; however, some adjustments in the STS and POI appear warranted.

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OCCUPATIONAL SURVEY REPORT
PLUMBING CAREER LADDER
(AFSC 552X5)

INTRODUCTION

This is a report of an occupational survey of the Plumbing career ladder completed by the Occupational Analysis Division, USAF Occupational Measurement Center. This survey was requested by the 3700th Technical Training Wing, Sheppard Technical Training Center, to obtain current task and equipment data for use in evaluation of current training programs. The last survey results pertaining to this career ladder were published in May 1980.

This survey includes both military and civilian members. The request to survey civilian personnel came from the Air Force Engineering Services Center (AFESC), Tyndall AFB FL. The inclusion of civilian personnel ensures a more complete coverage of jobs, since these personnel may be performing some tasks not performed by their military counterparts. Only continental United States (CONUS) civilian personnel participated in this survey. Those who completed the survey booklet did so on a voluntary basis; thus, civilian representation in some areas is not as complete as military representation. Those civilians included in this study are in Wage Grade Series 4206 (Plumber). The applicable job grading standard for the series can be found in Appendix C.

Background

Background: Job analysis, Personnel development, SDCS.

As described in AFR 39-1 Specialty Descriptions, personnel in this career ladder are responsible for installing and repairing pipe systems and plumbing fixtures and accessories. Meeting these responsibilities involves the performance of a variety of tasks pertaining to equipment and fixtures such as sinks, water closets, showers, water heaters, traps, vents, drains, pumps, valves, and fittings. Examples of repair procedures include removal and replacement of fixtures, and removal and replacement of component parts of fixtures, as well as processes such as soldering, brazing, and welding.

Entry into the career ladder is from Basic Military Training School (BMTS) through a Category B 6-week and 4-day formal training course conducted at Sheppard AFB, Texas; by directed duty assignment (DDA) from BMTS; or by retraining. For career ladders with Category B training, the desired goal is that 50 percent of the non-prior service personnel attend resident training. Entry into the career ladder currently requires an Armed Services Vocational Aptitude Battery (ASVAB) Mechanical score of 51.

SURVEY METHODOLOGY

Inventory Development

The data collection instrument for this occupational survey was USAF Job Inventory AFPT 90-552-752, dated August 1986. A tentative task list was prepared after reviewing pertinent career ladder publications and directives, tasks from the previous survey instrument, and data from the last Occupational Survey Report (OSR). The preliminary task list was refined and validated through personal interviews with 81 subject-matter experts selected to cover a variety of major commands (MAJCOM) and varying plumbing functions at the following locations:

<u>BASE</u>	<u>REASON FOR VISIT</u>
Bergstrom AFB TX	Representative of a small TAC base
Blytheville AFB AR	SAC aircraft and fire suppression mission
Dyess AFB TX	Representative of routine SAC plumbing requirements
Eglin AFB FL	AFESC detachment assigned which provides training for BARE BASE operations
Holloman AFB NM	Unique mission because of size and desert climate
Hurlburt Field FL	RED HORSE training function
Keesler AFB MS	Unique requirements because of environmental conditions
Kelly AFB TX	AFLC installation with industrial functions; personnel are part of unique San Antonio Real Property Maintenance Agency (SARPMMA)
McGuire AFB NJ	Older MAC base with older equipment and cold weather operations
Peterson AFB CO	Small Space Command base with few 552X5 resources
Randolph AFB TX	Representative of an ATC base with SARPMMA support

Scott AFB IL	Representative of a major MAC base with cold weather operations
Sheppard AFB TX	Location of ATC technical training courses
USAF Academy CO	Activity with a unique mission
Whiteman AFB MO	Representative of SAC missile operations and fire suppression systems
Wright-Patterson AFB OH	AFLC base representing many command plumbing functions and unique in the respect that it has many laboratory-type special plumbing functions

The resulting job inventory contained a comprehensive listing of 1,131 tasks grouped under 19 duty headings and a background section requesting such information as grade, duty title, types of valves and pumps used, types of pipelines worked on, tools or equipment used, and job satisfaction data. Prior to mailing, the survey instrument was reviewed by the American Federation of Government Employees (AFGE), the National Federation of Federal Employees (NFFE), and the National Association of Government Employees (NAGE).

Survey Administration

From September 1986 through January 1987, Consolidated Base Personnel Offices (CBPO) in operational units worldwide administered the inventory to military job incumbents holding DAFSCs 55235, 55255, or 55275. Inventories for civilian personnel were sent directly to their organizations. Since 9-skill level and Chief Enlisted Manager (CEM) Code personnel in this career ladder are responsible for supervision of three AFSCs other than 552X5, they were not included in the survey. Military participants were selected from a computer-generated mailing list obtained from personnel data tapes maintained by the Air Force Human Resources Laboratory (AFHRL). Civilian personnel were selected from a list supplied by the Civilian Personnel Management Center (CPMC).

Each individual who completed the inventory first completed an identification and biographical information section and then checked each task performed in his or her current job. After checking all tasks performed, each member then rated each of these tasks on a 9-point scale showing relative time spent on that task, as compared to all other tasks checked. The ratings ranged from one (very small amount time spent) through five (about average time spent) to nine (very large amount spent).

To determine relative time spent for each task checked by a respondent, all of the incumbent's ratings are assumed to account for 100 percent of his or her time spent on the job and are summed. Each task rating is then divided

by the total task ratings and multiplied by 100 to provide a relative percentage of time for each task. This procedure provides a basis for comparing tasks in terms of both percent members performing and average percent time spent.

Survey Sample

Personnel were selected to participate in this survey so as to ensure an accurate representation across major commands (MAJCOM), military paygrade, and civilian wage grade groups. Table 1 reflects the percentage distribution, by MAJCOM, of assigned military 552X5 personnel as of August 1986. The 1,240 military respondents in the final sample represent 70 percent of the total assigned AFSC 552X5 personnel. Table 2 reflects the paygrade distribution for military members. Table 3 displays civilian personnel representation.

Task Factor Administration

In addition to completing the job inventory, selected senior 55275 personnel (generally E-6 or E-7 technicians) also completed a second booklet for either training emphasis (TE) or task difficulty (TD). The TE and TD booklets were processed separately from the job inventories. The information is used in a number of different analyses discussed in more detail within the report.

Task Difficulty (TD). Each individual completing a TD booklet was asked to rate all of the tasks on a 9-point scale (from extremely low to extremely high) as to the relative difficulty of each task in the inventory. Difficulty is defined as the length of time required by the average incumbent to learn to do the task. Task difficulty data were independently collected from 30 experienced 7-skill level personnel stationed worldwide. If raters were in complete agreement on task difficulty ratings for the specialty, the interrater reliability would be 1.0. The interrater reliability (as assessed through components of variance of standard group means) of .91 for these 552X5 raters reflects a satisfactory agreement among raters. Ratings were standardized so tasks have an average difficulty rating of 5.00, with a standard deviation of 1.00. The resulting data yield essentially a rank ordering of tasks indicating the degree of difficulty for each task in the inventory.

Training Emphasis (TE). Individuals completing TE booklets were asked to rate tasks on a 10-point scale (from no training required to extremely high amount of training required). Training emphasis is a rating of which tasks require structured training for first-term personnel. Structured training is defined as training provided at resident technical schools, field training detachments (FTD), mobile training teams (MTT), formal OJT, or any other organized training method. Training emphasis data were independently collected from 37 experienced 7-skill level personnel stationed worldwide. As with task difficulty ratings, if all raters were in complete accord on which tasks are important for first-enlistment training, the interrater reliability would be 1.0. The interrater reliability (as assessed through components of variance of standard group means) for these raters was .91, indicating there

TABLE 1
COMMAND DISTRIBUTION OF 552X5 MILITARY PERSONNEL

<u>COMMAND</u>	<u>PERCENT OF ASSIGNED *</u>	<u>PERCENT OF SAMPLE</u>
SAC	23	25
TAC	17	15
MAC	13	12
ATC	11	10
USAFE	8	8
PACAF	8	9
AFLC	8	8
AFSC	4	4
AAC	3	3
OTHER	<u>5</u>	<u>6</u>
TOTAL	100	100

Total Assigned - 1,763

Total Eligible for Survey** - 1,519

Total in Sample - 1,240

Percent of Assigned in Sample - 70%

Percent of Eligible in Sample - 82%

* Assigned strength as of August 1986

** Excludes those personnel in PCS, student, or hospital status,
or with less than 6 weeks on the job

TABLE 2
PAYGRADE DISTRIBUTION OF SURVEY SAMPLE

<u>GRADE</u>	<u>PERCENT OF ASSIGNED *</u>	<u>PERCENT OF SAMPLE</u>
AIRMEN	38	36
E-4	28	30
E-5	19	19
E-6	11	10
E-7	4	5

* Assigned strength as of August 1986

TABLE 3
CIVILIANS ELIGIBLE/SURVEYED

<u>OCCUPATIONAL SERIES</u>	<u>NUMBER AVAILABLE FOR SURVEY</u>	<u>NUMBER RESPONDING</u>	<u>PERCENT OF AVAILABLE RESPONDING</u>
4206 (Plumber)	572	257	45%

was satisfactory agreement among raters as to which tasks required some form of structured training and which did not. In this specialty, tasks have an average TE rating of 2.78; tasks considered high in TE ratings have ratings of 4.28 and above. As was discussed in the Task Difficulty (TD) section above, TE rating data may also be used to rank order tasks indicating those tasks which senior NCOs in the field consider the most important for the first-term airman to know.

When used in conjunction with the primary criterion of percent members performing, TD and TE ratings can provide insight into first-term personnel training requirements. Such insights may suggest a need for lengthening or shortening portions of instruction supporting AFS entry-level jobs.

SPECIALTY JOBS (Career Ladder Structure)

A USAF occupational analysis begins with an examination of the career ladder structure. The structure of jobs within the Plumbing career ladder was examined on the basis of similarity of tasks performed and the percent of time spent ratings provided by job incumbents, independent of other specialty background factors.

Each individual in the sample performs a set of tasks called a job. For the purpose of organizing individual jobs into similar units of work, an automated job clustering program is used. This hierarchical grouping program is a basic part of the Comprehensive Occupational Data Analysis Program (CODAP) system for job analysis. Each individual job description (all the tasks performed by that individual and the relative amount of time spent on those tasks) in the sample is compared to every other job description in terms of tasks performed and the relative amount of time spent on each task in the job inventory. The automated system is designed to locate the two job descriptions with the most similar tasks and percent time ratings and combine them to form a composite job description. In successive stages, new members are added to initial groups or new groups are formed based on the similarity of tasks performed and similar time ratings in the individual job descriptions.

The basic identifying group used in the hierarchical job structuring process is the Job Type. When there is a substantial degree of similarity between Job Types, they are grouped together and identified as a Cluster. Specialized job types too dissimilar to fit within a Cluster are labeled Independent Job Types (IJT). The job structure information resulting from this grouping process (the various jobs within the career ladder) can be used to evaluate the accuracy of career ladder documents (AFR 39-1 Specialty Descriptions and Specialty Training Standards) and to gain a better understanding of current utilization patterns. The above terminology will be used in the discussion of the 552X5 career ladder structure.

Overview of Specialty Jobs

Responses from the 552X5 personnel in the survey sample indicate a career ladder where most people perform a rather large number of common tasks. Even so, based on some variations in combinations of tasks performed, structure analysis identified two clusters and five independent job types within the survey sample. Based on task similarity and relative time spent, the division of jobs performed by 552X5 personnel is illustrated in Figure 1, and a listing of those jobs is provided below. The stage (ST) number shown beside each title is a reference to computer printed information; the number of personnel in each group (N) is also shown. The reader should be aware that the number of personnel in the subgroups does not always equal the total number shown for a cluster. However, the jobs performed by those few not included are adequately described by the cluster description.

- I. PLUMBING PERSONNEL CLUSTER (ST0060, N=1,233)
 - A. Senior General Plumbers (ST0203, N=669)
 - B. Junior General Plumbers (ST0205, N=367)
 - C. Supervisory General Plumbers (ST0154, N=13)
 - D. Plumbing Installation Specialists (ST0175, N=33)
 - E. Structural Maintenance and Repair Team (SMART) Personnel (ST0085, N=40)
- II. FIRE SUPPRESSION SYSTEMS PERSONNEL IJT (ST0065, N=24)
- III. RAPID ENGINEER DEPLOYABLE, HEAVY OPERATIONS REPAIR SQUADRONS, ENGINEER (RED HORSE) PERSONNEL IJT (ST0243, N=6)
- IV. SUPERVISORY PERSONNEL CLUSTER (ST0034, N=109)
 - A. NCOICs and Shop Foremen (ST0086, N=84)
 - B. SMART Crew Supervisors (ST0178, N=10)
- V. TRAINING PERSONNEL IJT (ST0025, N=6)
- VI. PLANNERS IJT (ST0093, N=29)
- VII. PRIME BEEF (BASE ENGINEER EMERGENCY FORCES) TEAM MEMBERS IJT (ST0146, N=6)

The respondents forming these groups account for 94 percent of the survey sample. The remaining 6 percent were performing tasks or series of tasks which did not group with any of the defined jobs. Job titles given by respondents which were representative of these personnel included Unit Training Monitor, Construction Inspector, and Resource Advisor.

552X5 CAREER LADDER STRUCTURE (N=1,497)

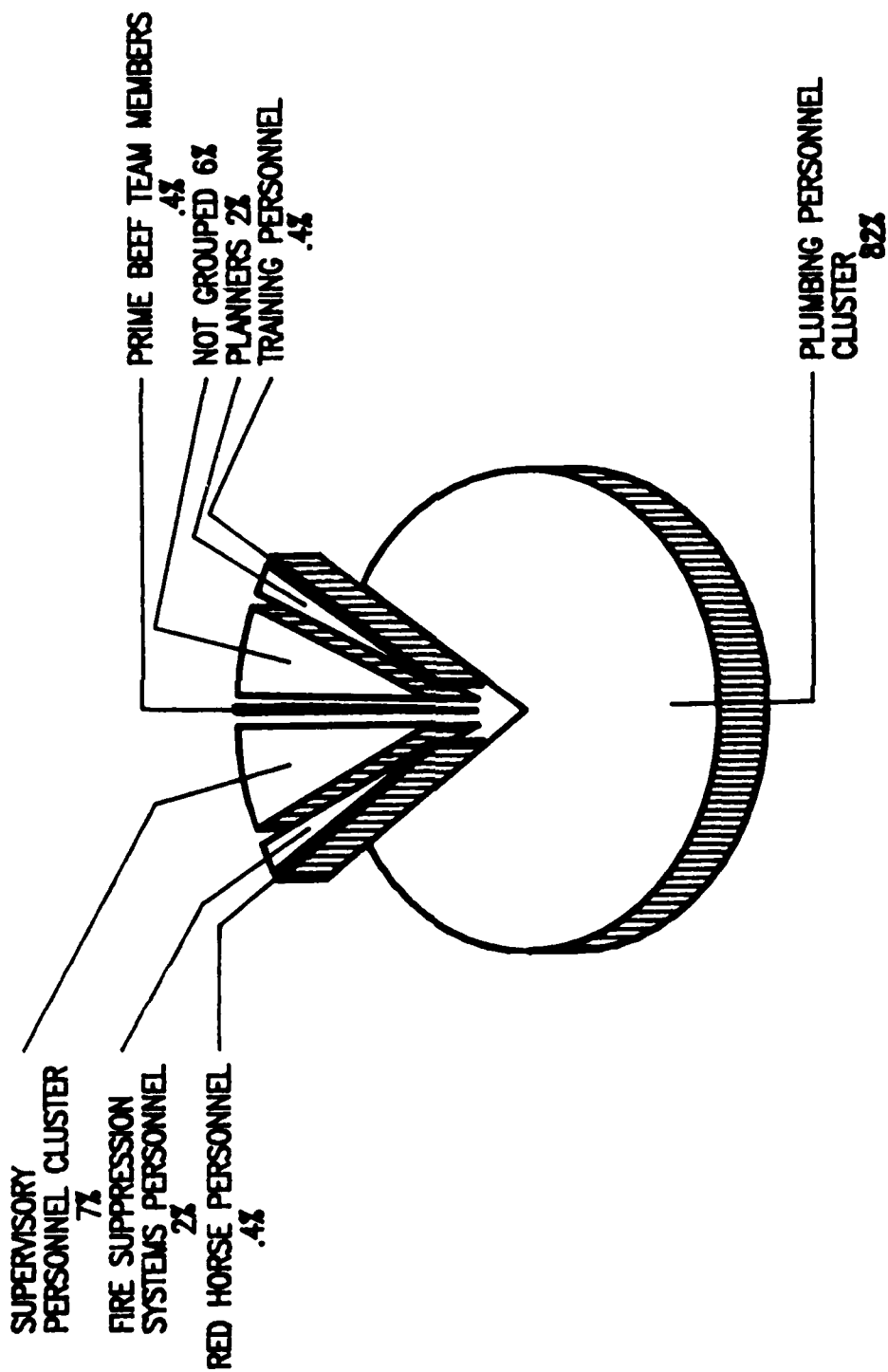


Figure 1

Group Descriptions

The following paragraphs contain brief descriptions of the clusters and independent job types identified through the career ladder structure analysis. Selected background data for these groups are provided in Table 4. Representative tasks for all the groups are contained in Appendix A.

I. PLUMBING PERSONNEL CLUSTER (ST0060). Comprised of five different jobs and representing the largest group in the career ladder structure (1,233 members and 82 percent of the total sample), these incumbents form the technical core of the Plumbing career ladder. Personnel forming this group (84 percent are military and 16 percent are civilian) perform a broad job encompassing the full range of the technical career ladder functions. Ninety-two percent of their relative job time is devoted to tasks and duties associated with installing, replacing, or maintaining the following: piping; plumbing fixtures and accessories; water, gas, and waste distribution systems; and pneumatic and fire suppression systems. Of the average 288 tasks performed (highest number of any group identified), typical ones include:

- cutting copper pipes or tubing
- inspecting plumbing fixtures
- assembling copper tubing using sweat soldered fittings
- replacing toilet bowls
- installing faucets
- locating gas leaks
- opening clogged drains

Although five jobs were identified within the cluster, three of them (Senior General Plumbers, Junior General Plumbers, and Supervisory General Plumbers) differed primarily because of the experience levels of the groups and the increasing amount of supervisory activity occurring. The remaining jobs (Plumbing Installation Specialists and SMART Personnel), although performing a variety of general plumbing tasks, were identified as a result of the amount of time spent focusing on installation and maintenance type tasks.

Military members of this cluster report an average grade of E-4 and an average of 5 years time in the service. Fifty-one percent are still in their first enlistment and 57 percent report holding a 5-skill level DAFSC. Civilian members of the cluster indicate over 12 years federal service, and the combined members report an average of 68 months experience in the career ladder.

II. FIRE SUPPRESSION SYSTEMS PERSONNEL (ST0065). The 24 members (2 percent of the sample) forming this independent job group are differentiated from the overall sample because of their specialization on tasks pertaining to fire suppression systems. Almost evenly balanced between civilian and military personnel (58 percent are civilian and 42 percent are

military), group members spend 48 percent of their relative duty time on tasks pertaining to installing, maintaining, and inspecting the various types of fire suppression systems (such as, deluge, wet pipe, foam, dry pipe, gaseous, and dry chemical). An additional 36 percent of their relative duty activity is spent in the performance of general plumbing tasks associated with and in support of these specialized systems, such as installing and maintaining piping, fittings and valves. Typical fire suppression system maintenance tasks include:

- resetting deluge fire suppression systems
- troubleshooting malfunctions to defective test valves
- performing local alarm device checks
- replacing fire suppression system components
- cleaning inside components of wet pipe fire suppression systems
- testing interior fire suppression systems for flow

Even though these personnel work primarily on fire suppression systems, the scope of the job is sufficiently broad that the average of 191 tasks performed is the second highest of all the clusters and independent jobs identified. With an average of almost eight years experience in the career ladder, the average grade for military personnel is E-4, while most civilians (11 of 14) report a grade of WG-09.

III. RED HORSE PERSONNEL (ST0243). All six members of this group are military personnel from several bases, with each indicating assignment to a RED HORSE unit (a unit designed to perform heavy damage repair and heavy maintenance to air bases or remote sites). Comprised predominantly of 5-skill level airmen (83 percent), this group spends very little time on plumbing maintenance tasks. The focus of activity for these airmen is toward tasks pertaining to construction and initial installation of pipes and fixtures. Representative tasks for this group include:

- operating cargo trucks
- attaching pipes to building structures
- installing plumbing fixtures in newly constructed structures
- backfilling trenches
- erecting portable showers
- cutting copper pipes or tubing

IV. SUPERVISORY PERSONNEL CLUSTER (ST0034). This cluster of 109 military and civilian personnel (75 percent and 25 percent respectively) represents 7 percent of the survey sample. Spending 67 percent of their relative job time performing tasks pertaining to general supervisory, managerial, training, and systems inspection duties, 94 percent of these members report supervisory responsibilities. An additional 22 percent of their job time is committed to tasks involving administrative functions. Personnel in this group reflect the

highest experience level of all the groups identified (an average of 14 years in the career field; and over 14 years in the service for military members and over 18 years federal service for civilians). With almost no technical task performance, typical supervisory and managerial-type tasks performed include:

- planning work assignments
- scheduling leaves or passes
- supervising Plumbing Specialists, Technicians,
and civilians
- writing APRs
- conducting OJT
- coordinating work assignments

Within this cluster are two job variations: NCOICs and Shop Foremen and SMART Crew Supervisors. The most noteworthy distinction between the two supervisory groups is the fact that the 10 members of the SMART Crew Supervisors job are all military and the average number of tasks performed (51 tasks) is less than the cluster as a whole (108 tasks).

V. TRAINING PERSONNEL (ST0025). The six personnel forming this independent job are all instructors assigned to the technical training center. With over 8 years in the career field (average grade is E-5), group members responded to some technically oriented tasks performed while demonstrating plumbing procedures, as well as those normally performed in an academic classroom or mock-up environment. Examples of tasks which define the group include:

- administering tests
- conducting remedial training
- preparing training aids
- scoring tests
- developing curriculum materials
- preparing lesson plans

VI. PLANNERS (ST0093). Representing 2 percent of the survey sample (29 members), personnel in this independent job group report working in the Planning function of the Civil Engineering organization. Their primary responsibilities involve preparation and handling of work orders and job orders, as well as inspecting facilities for maintenance and repair requirements. Typical tasks include:

- preparing cost estimates for in-service work requests
- performing facility surveys

reviewing AF Forms 327 (Base Civil Engineer Work Order)
to determine job requirements
coordinating work requirements
annotating AF Forms 1445 (Materials and Equipment List)

With an average grade of E-6 (all members are military) and an average of almost 12 years in the career field, this group is dominated by 7-skill level personnel (83 percent).

VII. PRIME BEEF TEAM MEMBERS (ST0146). The job performed by these six relatively senior military personnel (average grade is E-6, with 83 percent holding a 7-skill DAFSC) is characterized by the large amount of their relative duty time (81 percent) that is spent on tasks pertaining to contingency and disaster preparedness activities. They also plan and direct these operations. An additional 10 percent of their duty time is devoted to performing administrative tasks in support of contingency activities. The scope of this group's job is rather limited (an average of only 40 tasks), with only 25 tasks accounting for over 50 percent of their relative job time. Typical time-consuming contingency-oriented tasks include:

erecting tents
operating cargo trucks
constructing field fortifications
performing military field sanitation techniques
performing crater damage repair

Comparison of Military and Civilian Task Responses

One of the primary purposes for including civilian personnel in this survey was to determine whether civilian personnel were performing jobs or individual tasks which were not being performed by their military counterparts. The previous section of this report, Group Descriptions, described the various jobs performed by Plumbing personnel and indicated that, by and large, military and civilian members performed basically the same type jobs. Review of Table 4 reveals that only one job, FIRE SUPPRESSION SYSTEMS PERSONNEL, had a predominantly civilian orientation, and that was not significantly high in terms of the number of the sample involved (24 members - 58 percent civilian versus 42 percent military). Even here, relatively large numbers of the military personnel were performing tasks on fire suppression systems. While there were four jobs identified which had no civilian representation (RED HORSE PERSONNEL, TRAINING PERSONNEL, PLANNERS, and PRIME BEEF TEAM MEMBERS), personnel in these jobs represent only 3.2 percent of the total sample. This would not indicate any significant separation of the two bodies of the work force. The only noticeable difference in the overall task responses of these two groups was that the military personnel are the primary performers of contingency-type tasks.

TABLE 4

SELECTED BACKGROUND DATA FOR CLUSTERS AND INDEPENDENT JOB TYPES

	PLUMBING PERSONNEL CLUSTER	FIRE SUPPRESSION SYSTEMS PERSONNEL	RED HORSE PERSONNEL	SUPERVISORY PERSONNEL CLUSTER	TRAINING PERSONNEL	PLANNERS	PRIME BEEF TEAM MEMBERS
NUMBER IN GROUP	1,233	24	6	109	6	29	6
PERCENT MILITARY	84%	42%	100%	75%	100%	100%	100%
PERCENT CIVILIAN	16%	58%	0%	25%	0%	0%	0%
PERCENT OF TOTAL SAMPLE	82%	2%	.4%	7%	.4%	2%	.4%
PERCENT IN CONUS	81%	96%	50%	83%	100%	86%	100%

DAFSC DISTRIBUTION OR SERIES	E-4	E-4	E-4	E-6	E-5	E-6	E-6
55235	18%	4%	0%	1%	0%	0%	0%
55255	57%	29%	83%	13%	67%	17%	17%
55275	9%	9%	17%	61%	33%	83%	83%
4206	16%	58%	0%	25%	0%	0%	0%

AVERAGE MILITARY PAYGRADE	E-4	E-4	E-4	E-6	E-5	E-6	E-6
AVERAGE MONTHS IN CAREER FIELD	68	92	42	168	104	142	159
AVERAGE MONTHS MILITARY SERVICE	60	69	75	174	114	172	167
AVERAGE MONTHS CIVILIAN SERVICE	146	106	0	221	0	0	0

PERCENT IN FIRST ENLISTMENT	51%	16%	50%	1%	17%	0%	0%
PERCENT SUPERVISING	26%	25%	33%	94%	0%	17%	17%
AVERAGE NUMBER TASKS PERFORMED	288	191	106	108	42	46	40

In addition to the job group comparison, the military and civilian populations from the total sample were contrasted in a task-by-task comparison. Examination of the tasks reflected the overall similarity of the duties performed by the two groups. Additionally, there were no tasks being performed by civilians that were not also being performed by some number of military personnel. Thus, and importantly, military members are generally able to gain some experience on the full range of tasks performed across the career ladder. In summary, there appears to be no substantial difference in the overall jobs or tasks performed by military and civilian Plumbing personnel.

Comparisons of Specialty Jobs

Two clusters and five independent jobs were identified in the career ladder structure analysis. One cluster (with five jobs within) and two of the independent jobs were directly involved in the performance of the various technical duties of the career ladder (84 percent of the survey sample). The remaining cluster (with two jobs within) and independent jobs were oriented toward supervisory, training, planning, and contingency activities. Aside from the previously noted limited amount of general plumbing task performance by PRIME BEEF, RED HORSE, FIRE SUPPRESSION SYSTEMS, and PLANNING personnel (representing less than 5 percent of the sample), no noteworthy degree of specialization within the career ladder was identified. The career ladder appears to be very homogeneous, with the vast majority of personnel performing essentially the same basic job. Thus, the specialty job analysis and the survey data tend to support the current career ladder structure.

Comparison of Current Group Descriptions to Previous Survey Findings

The results of the specialty job analysis were compared to those of Occupational Survey Report (OSR) AFPT 90-552-387, PLUMBING AND ENVIRONMENTAL SUPPORT SPECIALTIES, dated May 1980. Table 5 displays a comparison of the Plumbing specialty jobs identified in each of the studies (note that the current study includes civilians, and the comparison study included another AFS-AFSC 566X1, Environmental Support). After reviewing the tasks comprising the jobs identified in 1980, most of the groups could be linked with similar task performances by 1987 sample groups. The appearance of differences (i.e., some of the specific job titles) is a surface difference only and can be attributed to modifications to the task list or to the analytical approach used.

Aside from some minor variations involving small numbers of personnel (i.e., the identification of the FIRE SUPPRESSION SYSTEMS PERSONNEL, TRAINING PERSONNEL, and PRIME BEEF TEAM MEMBERS jobs), the vast majority of the current sample could be matched to 552X5 jobs identified in 1980, thus displaying a relatively stable career ladder over time.

TABLE 5

JOB SPECIALTY COMPARISONS BETWEEN CURRENT AND 1980 SURVEY

CURRENT SURVEY (N=1,497)	PERCENT OF SAMPLE	1980 SURVEY - 552X5 (N=1,049)	PERCENT OF SAMPLE
PLUMBING PERSONNEL CLUSTER (N=1,233)	82	GENERAL PLUMBERS (N=699)	67
		DRAIN, FAUCET, WATER CLOSET RPMN (N=5)	1
		FIXTURE REPLACEMENT PERSONNEL (N=6)	1
		WATER SYSTEMS INSPECTORS (N=10)	1
		PIPE AND FIXTURE INSTALLERS (N=7)	1
		PIPE CUTTERS, THREADERS, ASSEMBLERS (N=5)	1
		PIPE ASSEMBLERS (N=7)	1
SUPERVISORY PERSONNEL CLUSTER (N=109)	7	PLUMBING SECTION SUPERVISORS (N=31)	3
		STRUCTURAL MAINTENANCE AND REPAIR MANAGERS (N=11)	1
PLANNERS (N=29)	2	PLUMBING PLANNERS (N=27)	3
RED HORSE PERSONNEL (N=6)	*	RED HORSE PLUMBERS (N=11)	1
FIRE SUPPRESSION SYSTEMS PERSONNEL (N=24)	2	NOT IDENTIFIED	-
PRIME BEEF TEAM MEMBERS (N=6)	*	NOT IDENTIFIED	-
TRAINING PERSONNEL (N=6)	*	NOT IDENTIFIED	-

* Denotes less than .5 percent

ANALYSIS OF DAFSC GROUPS

An analysis of DAFSC groups, in conjunction with the analysis of the career ladder structure, is an important part of each occupational survey. The DAFSC analysis identifies differences in tasks performed at the various skill levels. This information may then be used to evaluate how well career ladder documents, such as AFR 39-1 Specialty Descriptions and the Specialty Training Standard (STS), reflect what career ladder personnel are actually doing in the field.

A comparison of the duty and task performance between DAFSCs 55235 and 55255 indicated that, while there are some minor differences, by and large, the jobs they perform are essentially the same. Therefore, they will be discussed as a combined group in this report. Nine-skill level and CEM code personnel in the 552XX career field were not surveyed and will not be discussed in this report.

The distribution of skill-level groups across the career ladder jobs is displayed in Table 6, while Table 7 offers another perspective by displaying the relative percent time spent on each duty across the skill-level groups. A typical pattern of progression is present, with personnel spending more of their relative time on duties involving supervisory, managerial, and administrative tasks (See Table 7, Duties A, B, C, D, and E) as they move upward to the 7-skill level. It is also obvious, though, that 7-skill level personnel are still involved with technical task performance, as will be pointed out in the specific skill-level group discussions below.

Skill Level Descriptions

DAFSCs 55235/55255. The 1,017 airmen in the 3- and 5-skill level group (representing 82 percent of the survey sample) performed an average of 234 tasks, with 135 tasks accounting for over 50 percent of their job time. Performing a highly technical job, 87 percent of their relative duty time is devoted to tasks covering most plumbing installation and maintenance activities, as well as systems inspection and plumbing equipment operation and maintenance. Tasks pertaining to administrative functions and contingency operations accounted for an additional eight percent of their duty time. As shown in Table 6, 94 percent of these airmen are included in the four technically-oriented jobs. Table 8 displays selected representative time-consuming tasks performed by a majority of these airmen (see highlighted column in the upper half of the table) along with responses from 7-skill level personnel. With this arrangement, it is easy to see commonality and differences between the two groups. Tasks common to the 3- and 5-skill level airmen are also performed by fairly high percentages of the 7-skill level members.

DAFSC 55275. Seven-skill level personnel, representing 18 percent of the survey sample, perform an average of 204 tasks, with 137 tasks accounting for over 50 percent of their relative job time. Even though 74 percent of the group report supervisory responsibilities, only 49 percent of their relative job time is spent on tasks in the usual supervisory, managerial, training, and

TABLE 6
DISTRIBUTION OF DAFSC GROUP MEMBERS ACROSS SPECIALTY JOBS

SPECIALTY JOBS	DAFSC 55235/55 (N=1,017)		DAFSC 55275 (N=223)	
	NUMBER	PERCENT	NUMBER	PERCENT
I. PLUMBING PERSONNEL CLUSTER (N=1,233)	925	91%	105	47%
II. FIRE SUPPRESSION SYSTEMS PERSONNEL (N=24)	8	1%	2	1%
III. RED HORSE PERSONNEL (N=6)	5	1%	1	*
IV. SUPERVISORY PERSONNEL CLUSTER (N=109)	15	1%	67	30%
V. TRAINING PERSONNEL (N=6)	4	*	2	1%
VI. PLANNERS (N=29)	5	1%	24	11%
VII. PRIME BEEF TEAM MEMBERS (N=6)	1	*	5	2%
NOT GROUPED (N=71)	54	5%	17	8%

* Denotes less than .5 percent

TABLE 7
AVERAGE PERCENT TIME SPENT
PERFORMING DUTIES BY DAFSC GROUPS

DUTIES	DAFSC 55235/55255 (N=1,017)	DAFSC 55275 (N=223)
A ORGANIZING AND PLANNING	2	11
B DIRECTING AND IMPLEMENTING	3	10
C INSPECTING AND EVALUATING	1	7
D TRAINING	1	4
E PERFORMING ADMINISTRATIVE FUNCTIONS	3	17
F PERFORMING GENERAL FUNCTIONS	7	4
G INSPECTING SYSTEMS	4	5
H INSTALLING AND REPLACING PIPES, TUBING, FITTINGS, AND APPURTENANCES	23	10
I MAINTAINING PLUMBING FIXTURES AND EQUIPMENT	17	7
J MAINTAINING VALVES	16	7
K OPERATING AND MAINTAINING EQUIPMENT	5	3
L MAINTAINING WATER DISTRIBUTION SYSTEMS	6	3
M MAINTAINING SANITARY WASTE AND SEWER SYSTEMS	4	2
N INSTALLING AND MAINTAINING FIRE SUPPRESSION SYSTEMS	2	2
O MAINTAINING GAS DISTRIBUTION SYSTEMS	1	*
P MAINTAINING PNEUMATIC SYSTEMS	*	*
Q MAINTAINING ROOF DRAIN COLLECTION SYSTEMS	*	*
R OPERATING AND MAINTAINING SWIMMING POOLS	*	*
S PERFORMING CONTINGENCY OR TACTICAL TEAM TASKS	5	8

* Less than 1 percent

administrative duties (see Table 7). This relatively low supervisory activity is further highlighted by the fact that only 30 percent of the 223 people forming this group are found in the SUPERVISORY PERSONNEL CLUSTER discussed earlier in the SPECIALTY JOBS section (the one job that was predominantly supervisory in nature). A review of Table 6 shows that 59 percent of the 7-skill level personnel are found in the jobs that were identified as technical or planning oriented (PLUMBING PERSONNEL CLUSTER, FIRE SUPPRESSION SYSTEMS PERSONNEL, and PLANNERS). While the display of tasks in Table 8 clearly shows these senior personnel are responsible for supervision in the shops (see highlighted supervisory-type tasks in the bottom half of the table), it also reflects the range and scope of the job, in that relatively high percentages of the group are also performing a wide variety of day-to-day general plumbing tasks.

Summary

Career ladder progression is evident, with personnel at the 3- and 5-skill levels spending the vast majority of their job time performing technical tasks. At the 7-skill level, although members still spend almost one-half of their relative duty time on general technical plumbing functions, a shift toward supervisory functions is quite clear.

ANALYSIS OF AFR 39-1 SPECIALTY DESCRIPTIONS

Survey data were compared to the AFR 39-1 Specialty Descriptions for Plumbing Specialists and Technicians, both dated 31 October 1987.

The 3-and 5-skill level description is quite accurate in describing the overall job performed by these personnel. The only suggested improvement involves deletion of the task statement pertaining to using smoke for testing and inspecting pipe systems. The highest response of either group to this task was only 5 percent; thus, this would not appear to be a good representative example of their job.

The Plumbing Technician description accurately reflects both the supervisory and day-to-day technical nature of the 7-skill level job.

TRAINING ANALYSIS

Occupational survey data are one of the many sources of information which can be used to assist in the development of a training program relevant to the needs of personnel in their first enlistment. Factors which may be used in evaluating training include the overall description of the job being performed by first-enlistment personnel and their overall distribution across career ladder jobs, percentages of first-job (1-24 month TAFMS) or first-enlistment

TABLE 8

DISPLAY OF REPRESENTATIVE TASKS FOR AND DIFFERENCES
BETWEEN DAFSC GROUPS
(PERCENT MEMBERS PERFORMING)

TASKS	55235/55 (N=1,017)	55275 (N=223)
F213 CLEAN UP JOB SITES	90	52
I469 OPEN CLOGGED LAVATORIES	85	44
H344 CUT COPPER PIPES OR TUBING	84	47
H318 ASSEMBLE COPPER TUBING USING SWEAT SOLDERED FITTINGS	84	47
H392 REAM PIPING	84	45
J605 INSTALL FAUCETS	82	45
I583 REPLACE TOILET BOWLS	81	44
H391 MEASURE PIPE LENGTHS	76	46
H333 BACKFILL TRENCHES	74	38
H426 THREAD PIPES USING MOUNTED POWER THREADERS	74	41
J687 REPLACE WATER CLOSET TANK FLOAT VALVES	72	42
J675 REPLACE FAUCET COMPONENTS	72	43
H416 REPLACE LEAKING WATER PIPES	72	37
J676 REPLACE FLUSHOMETER VALVE COMPONENTS	71	39
K704 CLEAN PIPE THREADING MACHINES	71	38
I248 ADJUST WATER FLOW OF WATER FOUNTAINS	70	34
F228 MAKE GASKETS	68	36
J670 REPLACE ANGLE VALVES	63	35
L804 REPLACE FITTINGS ON INTERIOR WATER PIPING	63	34
G283 INSPECT PIPING FOR CORROSION	56	57
I589 REPLACE WATER HEATERS	56	32
H354 CUT OPENINGS IN WOOD STRUCTURES FOR INSTALLATION OF PLUMBING USING HANDTOOLS	51	30
H414 REPLACE LAWN SPRINKLER HEADS	50	23

C104 WRITE APRs	23	75
E134 ANNOTATE AF FORMS 1445 (MATERIALS AND EQUIPMENT LIST)	27	66
A6 COORDINATE WORK REQUIREMENTS	21	65
B74 SUPERVISE PLUMBING SPECIALISTS (AFSC 55255)	21	64
A23 PLAN WORK ASSIGNMENTS	18	61
E185 REVIEW AF FORMS 1879 (BCE JOB ORDER RECORD) TO DETERMINE JOB REQUIREMENTS	26	57
A29 SCHEDULE LEAVES OR PASSES	11	56
A5 COORDINATE WORK PROGRAMS WITH STRUCTURAL SUPERINTENDENTS	11	55
A16 ESTABLISH REQUIREMENTS FOR SUPPLIES	14	53
E197 REVIEW WORKING DRAWINGS TO DETERMINE PLUMBING INSTALLATION METHODS	24	50
D109 CONDUCT OJT	25	50

(1-48 months TAFMS) members performing specific tasks or using certain equipment or materials, as well as training emphasis and task difficulty ratings (previously explained in the SURVEY METHODOLOGY section).

To assist specifically in the evaluation of the Specialty Training Standard (STS) and the Plan of Instruction (POI), technical school personnel from Sheppard Technical Training Center matched job inventory tasks to appropriate sections and subsections of the STS and POI for Course J3ABR55235 000. It was this matching upon which comparison to those documents was based. A complete computer listing displaying the percent members performing tasks, training emphasis and task difficulty ratings for each task, along with the STS and POI matchings, has been forwarded to the technical school for their use in further detailed reviews of training documents. A summary of this information is presented below.

First-Enlistment Personnel

In this study, there are 660 members in their first enlistment (1-48 months TAFMS), representing over one-half (53 percent) of the total military survey sample. The job performed by these personnel is highly technical in nature and covers the full range of significant plumbing technical activities. As displayed in Table 9, approximately 96 percent of their duty time is devoted to technical, administrative, or contingency task performance. Additionally, Table 9 reflects that some of their job time is spent dealing with the installation and maintenance of the various types of fixtures, valves, and systems which are significant parts the career ladder. This suggests that AFSC 552X5 first-enlistment personnel are able to gain experience in the full range of tasks relating to the specialty. Distribution of these personnel across career ladder jobs is displayed in Figure 2, which shows the vast majority of first-term personnel are involved in day-to-day plumbing activities. Table 10 displays just some of the average 236 tasks performed by the group, and is intended to represent a range of tasks across the various types of plumbing installation and maintenance activities.

One of the objectives of this survey project was to gather data for the technical training center pertaining to types of tools or equipment, valves, and pumps currently used in the field, along with the various systems personnel install or maintain (i.e., corrosion protection, fire suppression, gas, etc.). Accordingly, Tables 11 through 17 present percentages of first-term airmen responding to questions concerning their activities involving these items. This type of information is useful for both the technical school and MAJCOM training personnel to assist them in focusing limited training time or other resources on the most appropriate items or systems.

Training Emphasis and Task Difficulty Data

Training emphasis (TE) and task difficulty (TD) data are secondary factors that can assist technical school personnel in deciding what tasks should be emphasized in entry-level training. These ratings, based on the

TABLE 9
RELATIVE TIME SPENT ON DUTIES
BY FIRST-ENLISTMENT PERSONNEL

DUTIES	PERCENT TIME SPENT
A ORGANIZING AND PLANNING	1
B DIRECTING AND IMPLEMENTING	1
C INSPECTING AND EVALUATING	1
D TRAINING	1
E PERFORMING ADMINISTRATIVE FUNCTIONS	2
F PERFORMING GENERAL FUNCTIONS	7
G INSPECTING SYSTEMS	4
H INSTALLING AND REPLACING PIPES, TUBING, FITTINGS, AND APPURTENANCES	24
I MAINTAINING PLUMBING FIXTURES AND EQUIPMENT	19
J MAINTAINING VALVES	17
K OPERATING AND MAINTAINING EQUIPMENT	5
L MAINTAINING WATER DISTRIBUTION SYSTEMS	6
M MAINTAINING SANITARY WASTE AND SEWER SYSTEMS	4
N INSTALLING AND MAINTAINING FIRE SUPPRESSION SYSTEMS	1
O MAINTAINING GAS DISTRIBUTION SYSTEMS	2
P MAINTAINING PNEUMATIC SYSTEMS	1
Q MAINTAINING ROOF DRAIN COLLECTION SYSTEMS	*
R OPERATING AND MAINTAINING SWIMMING POOLS	*
S PERFORMING CONTINGENCY OR TACTICAL TEAM TASKS	4

* Denotes less than .4 percent

DISTRIBUTION OF FIRST-ENLISTMENT PERSONNEL
ACROSS SPECIALTY JOBS
(N=660)

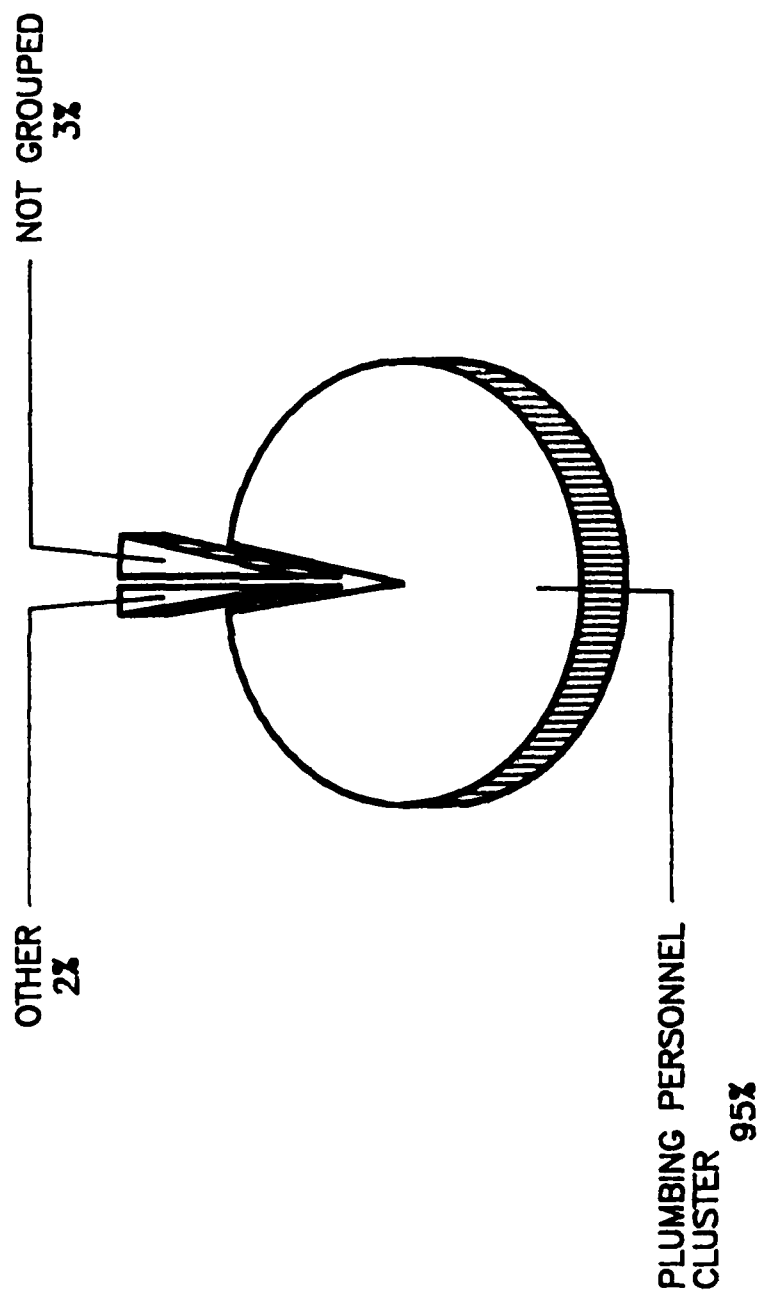


Figure 2

TABLE 10
REPRESENTATIVE TASKS PERFORMED
BY 552X5 FIRST-ENLISTMENT PERSONNEL

TASKS	PERCENT MEMBERS PERFORMING (N=660)
I471 OPEN CLOGGED SINK DRAINS	93
H344 CUT COPPER PIPES OR TUBING	88
H392 REAM PIPING	88
H318 ASSEMBLE COPPER TUBING USING SWEAT SOLDERED FITTINGS	87
J605 INSTALL FAUCETS	86
H356 CUT PLASTIC PIPES OR TUBING	85
H346 CUT GALVANIZED STEEL PIPES	84
I460 INSTALL TOILET BOWLS	85
J645 REMOVE FAUCETS	84
I583 REPLACE TOILET BOWLS	84
H315 ASSEMBLE COPPER TUBING USING FERRULED FITTINGS	83
H334 BEND TUBING BY HAND	83
J599 INSTALL ANGLE VALVES	82
H316 ASSEMBLE COPPER TUBING USING FLARED FITTINGS	82
H391 MEASURE PIPE LENGTHS	81
J606 INSTALL FLUSHOMETER VALVES	81
H393 REAM TUBING	80
H426 THREAD PIPES USING MOUNTED POWER THREADERS	78
I584 REPLACE URINALS	78
L783 LOCATE LEAKS IN WATER PIPES	77
H416 REPLACE LEAKING WATER PIPES	76
K704 CLEAN PIPE THREADING MACHINES	76
J675 REPLACE FAUCET COMPONENTS	75
J686 REPLACE WATER CLOSET TANK FLOAT VALVE COMPONENTS	75
J676 REPLACE FLUSHOMETER VALVE COMPONENTS	74
J688 REPLACE WATER CLOSET TANK FLUSH VALVE COMPONENTS	73
J664 REMOVE WATER CLOSET TANK FLOAT VALVE COMPONENTS	71
L804 REPLACE FITTINGS ON INTERIOR WATER PIPING	67
H340 CUT BLACK IRON PIPES (STEEL)	67
H357 DISSASSEMBLE FLANGED PIPES AND FITTINGS	61
H314 ASSEMBLE CAST IRON NO HUB PIPES	60
I589 REPLACE WATER HEATERS	59
H320 ASSEMBLE FLANGED PIPES AND FITTINGS	58
H414 REPLACE LAWN SPRINKLER HEADS	53

* Average number of tasks performed - 236

TABLE 11

TOOLS OR EQUIPMENT USED BY 50 PERCENT OR
MORE OF FIRST-ENLISTMENT PERSONNEL
(1-48 MONTHS TAFMS)

TOOLS OR EQUIPMENT USED	PERCENT MEMBERS RESPONDING (N=660)
BASIN WRENCHES	96
SHOVELS	95
FLARING TOOLS	93
TUBING CUTTERS	93
VACUUM PLUNGERS	90
BENCH THREADERS	89
PIPE VISES	89
HAND DRAIN AUGERS	88
PIPE THREADERS, HAND-OPERATED	88
ELECTRIC DRILLS	87
PROPANE TORCHES	87
GENERAL PURPOSE VEHICLES	86
SLEDGE HAMMERS	85
POWER DRAIN AUGERS	84
POWER SEWER AUGERS	83
HYDRANT WRENCHES	82
SNAP CUTTERS	81
CHAIN CUTTERS	76
HAND SEWER AUGERS	76
SEAT WRENCHES	76
BENCH GRINDERS	72
GEARED PIPE THREADERS	70
STRAP WRENCHES	67
ACETYLENE TORCHES	66
PORTABLE THREADERS	60
BLOW BAGS	57
PRESSURE PLUNGERS	56
STEEL RIBBON TAPE	56
PROBING RODS	55
STEEL ROD SEWER CLEANERS	54
ELECTRIC METAL PIPE LOCATORS	53
NOHUB WRENCHES	53
VALVE RESEATING KITS	51
PITOT TUBES	51

TABLE 12
VALVES USED BY FIRST-ENLISTMENT PERSONNEL
(1-48 MONTHS TAFMS)

TYPE VALVES	PERCENT MEMBERS RESPONDING (N=660)
GATE	98
GLOBE	93
CHECK	91
ANGLE	90
BALL	78
PRESSURE RELIEF	74
BACKFLOW PREVENTION	73
OUTSIDE SCREW AND YOKE (OS&Y)	67
PLUG	63
POST INDICATOR	62
PRESSURE REGULATING	53
GAS COCK	46
BUTTERFLY	34
ELECTRIC	26
NEEDLE	25
VELOCITY CHECK	14
ALTITUDE	12
HYDRAULIC	7
MULTIPORT	4

TABLE 13

PUMPS USED BY FIRST-ENLISTMENT PERSONNEL
(1-48 MONTHS TAFMS)

TYPE PUMP	PERCENT MEMBERS RESPONDING (N=660)
DIAPHRAGMS	80
SUMPS	76
CENTRIFUGALS	69
CIRCULATING	49
PLUNGERS	36
BOOSTERS	26
VACUUMS	26
FIREPUMPS	9
PISTONS	8
HYDRAULICS	5
SCREWS	4
MULTI-STAGES	2
TURBINES	2
PROGRESSIVE CAVITIES	1

TABLE 14

CORROSION PROTECTION SYSTEM WORKED ON BY
FIRST-ENLISTMENT PERSONNEL
(1-48 MONTHS TAFMS)

TYPE CORROSION PROTECTION SYSTEM	PERCENT MEMBERS RESPONDING (N=660)
DIELECTRIC UNION	64
PROTECTIVE WRAPPING	54
GALVANIC ANODES CATHARTIC	10
MAGNESIUM ANODES	4

TABLE 15

FIRE SUPPRESSION SYSTEM WORKED ON
(PERCENT MEMBERS RESPONDING)

<u>TYPE FIRE SUPPRESSION SYSTEM</u>	<u>1ST JOB (N=284)</u>	<u>1ST ENL (N=660)</u>	<u>DAFSC 55255 (N=785)</u>	<u>DAFSC 55275 (N=223)</u>	<u>MILITARY TOTAL SAMPLE (N=1,240)</u>
WET PIPE	49	55	57	46	53
DELUGE	39	42	42	36	40
DRY PIPE	38	42	43	38	41
FOAM	21	24	24	21	23
STAND PIPE	21	25	29	29	27
DRY CHEMICAL	17	19	20	20	20
PREACTION	17	18	19	20	19
GASEOUS	2	5	6	7	5

TABLE 16

MILITARY PERSONNEL MAINTAINING FIRE TRUCKS
OR WATER DISTRIBUTION TRUCKS
(PERCENT RESPONDING YES)

<u>QUESTIONS</u>	<u>1ST JOB (N=284)</u>	<u>1ST ENL (N=660)</u>	<u>DAFSC 55255 (N=785)</u>	<u>DAFSC 55275 (N=223)</u>	<u>MILITARY TOTAL SAMPLE (N=1,240)</u>
DO YOU PERFORM MAINTENANCE ON FIRE TRUCKS?	.7	.5	1	1	1
DO YOU PERFORM MAINTENANCE ON WATER DISTRIBUTION TRUCKS?	6	8	8	12	8

TABLE 17

MILITARY PERSONNEL WORKING ON GAS PIPELINE-DISTRIBUTION SYSTEMS
(PERCENT MEMBERS RESPONDING YES)

QUESTIONS	1ST JOB (N=284)	1ST ENL (N=660)	DAFSC 55255 (N=785)	DAFSC 55275 (N=223)	MILITARY TOTAL SAMPLE (N=1,240)
<u>TYPE GAS DISTRIBUTION SYSTEM</u>					
NATURAL GAS	57	55	52	39	51
LIQUEFIED PETROLEUM GAS (LPG)	0	.3	.5	1	.6
COMBINATION NATURAL GAS AND LPG	2	3	3	6	4
<u>TYPE GAS PIPELINE</u>					
BLACK IRON (STEEL)	58	56	53	43	52
POLYETHYLENE	22	23	23	23	23
PLASTIC	21	20	17	17	17
CAST IRON	18	17	14	15	15
PVC	17	17	14	13	14
YELLOW WRAPPED	14	15	18	17	17
COPPER	13	14	13	17	14
FLEXIBLE STEEL COVERED POLYETHYLENE	6	5	5	5	5
<u>TYPE GAS REGULATORS</u>					
SERVICE	32	30	30	26	30
DISTRICT	14	9	5	7	7
EXPANSIBLE TUBE PRESSURE	1	1	.5	.5	.6

judgments of senior career ladder NCOs working at operational units in the field, are collected to provide training personnel with a rank-ordering of those tasks considered important for first-term airman training (TE), along with a measure of the difficulty of those tasks (TD). When combined with data on the percentages of first-enlistment personnel performing tasks, comparisons can then be made to determine if training adjustments are necessary. For example, tasks receiving high ratings on both task factors, accompanied by moderate to high percentages performing, may warrant resident training. Those tasks receiving high task factor ratings, but low percentages performing, may be more appropriately planned for OJT programs within the career ladder. Low task factor ratings may highlight tasks best omitted from training for first-term personnel, but this decision must be weighed against percentages of personnel performing the tasks, command concerns, and criticality of the tasks. Various lists of tasks, accompanied by TE and TD ratings, are contained in the TRAINING EXTRACT package and should be reviewed in detail by technical school personnel. (For a more detailed explanation of TE and TD ratings, see Task Factor Administration in the SURVEY METHODOLOGY section of this report).

Specialty Training Standard (STS)

A comprehensive review of STS 552X5, dated March, 1984, compared STS items to survey data. STS paragraphs containing general knowledge information, subject-matter knowledge requirements, or supervisory responsibilities were not evaluated. Overall, the STS provides comprehensive coverage of the work performed in the field, with survey data supporting each of the significant paragraphs and most of the subparagraphs.

Two elements of the STS do require review of 3-skill level proficiency coding by training personnel and subject-matter experts. Table 18 displays data pertaining to these elements. Paragraphs 10f(1) and 10f(2) reflect a dash (-) proficiency code for 3-skill level personnel. Yet, review of the survey data pertaining to tasks matched to these elements (very high TE ratings, above average TD ratings, and sufficiently high percentages of first-job or first-enlistment members performing) suggests that task knowledge or even task performance level coding may be more appropriate and justifiable. Also requiring evaluation are paragraphs 12a(5) and 12b(5). Tasks keyed to these paragraphs (both involving gas regulators) show less than 20 percent of the criterion groups responding to the tasks, and TE ratings which are not high (4.28 or above). These paragraphs should be reviewed to determine if retention in the STS is warranted.

Tasks not matched to any element of the STS are listed at the end of the STS computer listing. These were reviewed to determine if there were any tasks concentrated around any particular functions or jobs. No particular trends were noted. Examples of technical tasks performed by 20 percent or more respondents of the STS target groups, but which are not referenced to any STS element, are displayed in Table 19. Training personnel and subject-matter experts should review these and other eligible unreferenced tasks to determine if inclusion in the STS is justified.

TABLE 18

STS ELEMENTS REQUIRING REVIEW

STS ITEM (WITH SELECTED SAMPLE TASKS)	PERCENT MEMBERS PERFORMING						TNG EMP*	TASK DIFF**
	3 LVL PROF CODE	1ST JOB (N=284)	1ST ENL (N=660)	DAFSC 55255 (N=785)	DAFSC 55275 (N=223)			
10f(1) TAP PIPE USING TAPPING MACHINE	-	23	27	25	17	5.03	6.36	
H423 TAP PIPE USING TAPPING MACHINES								
10f(2) TAP PIPE USING SADDLE AND TAPS	-	31 26	34 36	35 38	18 21	4.89 5.11	5.10 5.12	
H421 TAP PIPES USING HAND TAPS G422 TAP PIPES USING SADDLES								
12a(5) INSTALL GAS REGULATORS	1a	5 7	12 7	14 5	7 4	3.16 1.32	5.32 5.73	
0935 INSTALL SERVICE GAS REGULATORS 0932 INSTALL DISTRICT GAS REGULATORS								
12b(5) REPAIR GAS REGULATORS	1a	8 8 5	11 11 5	13 13 4	9 7 4	2.76 2.49 1.49	4.55 4.79 4.95	
0954 REMOVE SERVICE GAS REGULATORS 0966 REPLACE SERVICE GAS REGULATORS 0961 REPLACE DISTRICT GAS REGULATORS								

* Mean TE Rating is 2.78 and Standard Deviation is 1.50 (High TE = 4.28)

** Average TD Rating is 5.00

TABLE 19

EXAMPLES OF TECHNICAL TASKS PERFORMED BY 20 PERCENT OR MORE
GROUP MEMBERS AND NOT REFERENCED TO THE STS

TASKS	PERCENT MEMBERS PERFORMING					TE RATING*	TD RATING**
	1ST JOB (N=284)	1ST ENL (N=660)	DAFSC 55255 (N=785)	DAFSC 55275 (N=223)			
E133 ANNOTATE AF FORMS 1255 (QUALITY CONTROL EVALUATION)	11	14	20	30		2.86	3.28
E134 ANNOTATE AF FORMS 1445 (MATERIALS AND EQUIPMENT LIST)	14	18	31	66		3.32	4.14
E146 COORDINATE FIRE PERMITS	5	12	17	21		2.89	3.99
E165 PREPARE AF FORMS 332 (BCE WORK REQUEST)	6	7	11	36		2.16	4.47
G258 INSPECT CONTRACTOR JOBS	10	13	17	28		2.05	6.16
I585 REPLACE WASHERS ON BAR SINKS	24	33	34	19		3.68	3.63
I486 REMOVE COMMERCIAL FOOD GRINDER (DISPOSAL) COMPONENTS	19	25	25	14		2.78	5.05
I510 REMOVE DRAIN BASKETS ON BAR SINKS	14	22	24	18		3.59	3.94
I568 REPLACE DRAIN BASKETS ON BAR SINKS	19	28	31	17		4.03	3.90
I545 REPLACE COMMERCIAL FOOD GRINDER (DISPOSAL) COMPONENTS	18	23	24	14		1.95	5.50
K692 ADJUST FLOAT CONTROLS	39	42	37	19		1.81	4.44

* Mean TE Rating is 2.78 and Standard Deviation is 1.50 (High TE = 4.28)

** Average TD Rating is 5.00

Plan of Instruction (POI)

Based on the previously mentioned assistance from the technical school subject-matter experts in matching inventory tasks to the 3ABR55235 000 POI, dated 26 March 1986, a computer product was generated displaying the results of the matching process. Information furnished for consideration includes percent members performing data for first-job (1-24 months TAFMS) and first-enlistment (1-48 months TAFMS) personnel, as well as training emphasis (TE) and task difficulty (TD) ratings for individual tasks.

Review of tasks matched to the POI reveals that most POI blocks and units of instruction are well supported by survey data based on percentages of first-term personnel performing tasks or high TE or TD ratings for pertinent tasks. There are four units of instruction, however, which contain objectives that apparently are not supported by survey data and require further evaluation by training personnel and subject-matter experts (see display in Table 20). While many of these selected sample tasks have above average TD ratings, all reflect less than 30 percent of the first-term population performing, and only one received a high TE rating (4.28 or above). The combination of low percent performing and TE factors suggests the need for a close look at the pertinent objectives in these units of instruction to determine if retention of these 23 hours in the ABR course is justified.

Additionally, some apparently significant tasks with high TE ratings, sufficiently high TD ratings, and 30 percent or more first-job or first-enlistment personnel performing were not matched to any POI blocks of instruction. This combination of factors indicates formal training may be required and resident technical training could be supported. Table 21 lists a sampling of a number of such tasks. Subject-matter experts and training personnel should perform an in-depth review of these and other qualifying tasks contained in the "Tasks Not Referenced" section of the previously mentioned computer printout to determine the necessity for training and the most effective method to accomplish it.

Overall, the current training program appears to be very effective, with first-term personnel rendering very high positive ratings on utilization of training (see Table 23, JOB SATISFACTION ANALYSIS section, below).

JOB SATISFACTION ANALYSIS

An examination of the job satisfaction indicators of various groups can give career ladder managers a better understanding of some of the factors which may affect the job performance of airmen in the career ladder. Attitude questions covering job interest, perceived utilization of talents and training, sense of accomplishment from work, and reenlistment intentions were included in the survey booklet to provide indications of job satisfaction. Table 22 presents job satisfaction data for the specialty jobs discussed in the SPECIALTY JOBS section of this report. An examination of these data can show how overall job satisfaction may be influenced by the type of job

TABLE 20

POI BLOCKS REFLECTING LOW FIRST-ENLISTMENT TASK PERFORMANCE
(LESS THAN 30 PERCENT RESPONDING)

POI REFERENCE BLOCK - UNIT	TIME (HOURS)	SELECTED SAMPLE TASKS	PERCENT MEMBERS PERFORMING			TNG EMP*	TASK DIFF**
			1ST JOB (N=284)	1ST ENL (N=660)			
IV 6d	2:00	P974 INSTALL BLACK IRON (STEEL) AIR DISTRIBUTION LINES	15	19		3.46	4.92
		P990 REPLACE AIR PRESSURE REGULATORS	7	11		2.81	4.65
		P976 INSTALL COPPER AIR DISTRIBUTION LINES	6	11		2.86	4.89
V 2d-g	4:00	G272 INSPECT FOAM FIRE SUPPRESSION SYSTEMS	9	11		3.08	7.33
		G261 INSPECT DRY CHEMICAL FIRE SUPPRESSION SYSTEMS	12	14		3.59	6.63
		G270 INSPECT FIXED GASEOUS FIRE SUPPRESSION SYSTEMS	4	5		2.27	6.94
V 4c	3:00	0935 INSTALL SERVICE GAS REGULATORS	9	12		3.16	5.32
		0932 INSTALL DISTRICT GAS REGULATORS	7	7		1.32	5.73
V 4e-h	14:00	H327 ASSEMBLE PLASTIC PIPES USING THERMAL FUSION	21	20		4.30	5.31
		G273 INSPECT GAS DISTRICT REGULATORS	12	10		2.22	5.82
		G274 INSPECT GAS SERVICE REGULATORS	18	18		3.30	5.75
		0923 ADJUST SERVICE GAS REGULATOR	5	6		2.43	5.60
		0953 REMOVE SERVICE GAS REGULATOR DIAPHRAGMS	5	6		2.41	4.72
		0966 REPLACE SERVICE GAS REGULATORS	8	11		2.49	4.79

* Mean TE Rating is 2.78 and Standard Deviation is 1.50 (High TE = 4.28)

** Average TD Rating is 5.00

TABLE 21

SAMPLING OF TASKS NOT REFERENCED TO 3ABR55235 000 PGI BLOCKS
(30 PERCENT OR MORE PERFORMING)

EXAMPLES OF TASKS NOT REFERENCED		PERCENT MEMBERS PERFORMING		TNG EMP*	TASK DIFF**
		1ST JOB (N=284)	1ST ENL (N=660)		
J626	INSTALL VALVES USING THREADED CONNECTIONS	77	80	4.92	4.48
L805	REPLACE FITTINGS ON WATER DRAINS	57	62	4.41	4.78
H317	ASSEMBLE COPPER TUBING USING SILVER SOLDERED FITTINGS	44	46	5.00	5.65
H382	INSTALL SUMP PUMPS	41	48	4.38	5.01
J622	INSTALL VALVES USING MECHANICAL JOINTS	33	39	4.43	5.20
H427	THREAD PIPES USING PORTABLE HAND-HELD POWER THREADERS	33	39	5.38	4.87
I457	INSTALL SERVICE SINKS	31	38	4.92	5.35
H421	TAP PIPES USING HAND TAPS	31	34	4.89	5.10
J629	LOCATE UNDERGROUND VALVES BY ELECTRONIC DEVICES	27	33	4.95	5.45
H422	TAP PIPES USING SADDLES	26	36	5.11	5.12

* Mean TE Rating is 2.78 and Standard Deviation is 1.50 (High TE = 4.28)

** Average TD Rating is 5.00

performed. Another view of job satisfaction data is reflected in Table 23 where data for AFSC 552X5 TAFMS groups are displayed, together with data for a comparative sample of Direct Support career ladders surveyed in 1986. These data can give a relative measure of how the job satisfaction of AFSC 552X5 personnel compares with that of other similar AF specialties. Finally, an indication of how job satisfaction perceptions within the career ladder have changed over time is provided in Table 24, where TAFMS group data for 1987 survey respondents is presented, along with data from respondents to the last occupational survey involving this career ladder, published in 1980.

In general, as reflected in Tables 22 through 24, the percentages of various group members responding positively to the job satisfaction indicators were high. For example, a review of job satisfaction data for the specialty jobs identified in the analysis (see Table 22) reveals that personnel in all but one specialty job (RED HORSE PERSONNEL - representing only .4 percent of the sample) responded very positively to all of the indicators listed. Additionally, review of the job inventory write-in comments from survey sample personnel further supports the high job satisfaction indications for the overall career ladder as displayed in Table 22.

When there are serious problems in a career ladder, survey respondents are usually quite free with write-in comments to complain about perceived problems in the field. Seven percent of the survey sample used the write-in feature to convey some type of information, yet only 4.5 percent of the comments (representing less than 1 percent of the survey sample) could be characterized as complaints. No particular trends were noted among the few comments received.

Further, as reflected in Table 23, the positive responses for AFSC 552X5 personnel are almost all higher than those of the comparative sample; the one exception being the lower reenlistment intentions for the 1987 1-48 Months TAFMS group. Examination of job satisfaction indicators for 1987 and 1980 TAFMS groups (see Table 24) reflects that all favorable response percentages are higher for the current "1-48 month" and "49-96 month" groups. Figures for the current study "Career" group (97+ months), while slightly lower in some cases, are still quite high. The high percentages of positive responses in these comparisons reflect a career ladder where personnel appear to be well satisfied with their jobs.

SPECIAL ANALYSIS

In response to requests for a variety of different types of information by the Air Force Engineering and Services Center (AFESC), technical training personnel, and other data users, a series of special background questions were included in the survey instrument. The types of questions varied and included such items as: the percentage of personnel completing some type of vocational training before enlisting in the Air Force; percentage responding to the types of plumbing references used; and to various types of personnel control badges possessed. The response data to these various questions are compiled in table format and are presented in Appendix B (Tables B1 through B7).

TABLE 22

COMPARISONS OF JOB SATISFACTION INDICATORS BY SPECIALTY JOB GROUPS
(PERCENT MEMBERS RESPONDING)*

	PLUMBING PERSONNEL CLUSTER (N=1,233)	FIRE SUPPRESSION SYSTEMS PERSONNEL (N=29)	RED HORSE PERSONNEL (N=6)	SUPERVISORY PERSONNEL CLUSTER (N=109)	TRAINING PERSONNEL (N=6)	PLANNERS (N=29)	PRIME BEEF TEAM MEMBERS (N=6)
<u>EXPRESSED JOB INTEREST:</u>							
INTERESTING	79	83	33	81	67	86	83
SO-SO	14	17	17	13	17	7	0
DULL	6	0	50	6	17	7	17
<u>PERCEIVED USE OF TALENTS:</u>							
FAIRLY WELL TO PERFECTLY LITTLE OR NOT AT ALL	85 14	92 8	50 50	88 11	83 17	83 17	83 17
<u>PERCEIVED USE OF TRAINING:</u>							
FAIRLY WELL TO PERFECTLY LITTLE OR NOT AT ALL	87 12	92 8	50 50	83 16	50 50	83 17	83 17
<u>SENSE OF ACCOMPLISHMENT FROM JOB:</u>							
SATISFIED	79	79	67	75	83	86	83
NEUTRAL	10	8	33	12	0	7	0
DISSATISFIED	10	8	0	12	17	7	17
<u>REENLISTMENT INTENTIONS (MILITARY):</u>							
YES, OR PROBABLY YES	65	60	83	73	100	79	83
NO, OR PROBABLY NO	31	40	0	7	0	4	17
PLAN TO RETIRE	.3	0	0	17	0	17	0

* Columns may not add to 100 percent due to nonresponse or rounding

TABLE 23

COMPARISON OF JOB SATISFACTION INDICATORS BY TAFMS GROUPS
(PERCENT MEMBERS RESPONDING)*

	1-48 MONTHS TAFMS		49-96 MONTHS TAFMS		97+ MONTHS TAFMS	
	COMPARATIVE SAMPLE** (N=660)		COMPARATIVE SAMPLE** (N=226)		COMPARATIVE SAMPLE** (N=750)	
EXPRESSED JOB INTEREST:						
INTERESTING	75	57	79	58	82	69
SO-SO	16	22	15	22	11	17
DULL	8	20	6	20	5	13
PERCEIVED UTILIZATION OF TALENTS:						
FAIRLY WELL TO PERFECTLY	83	62	84	66	83	75
LITTLE OR NOT AT ALL	16	36	15	33	16	24
PERCEIVED UTILIZATION OF TRAINING:						
FAIRLY WELL TO PERFECTLY	88	78	81	67	83	70
LITTLE OR NOT AT ALL	12	20	18	32	16	29
REENLISTMENT INTENTIONS:						
YES, OR PROBABLY YES	56	64	79	72	76	74
NO, OR PROBABLY NO	42	34	20	26	5	8
PLAN TO RETIRE	***	***	***	1	16	17

* Columns may not add to 100 percent due to nonresponse or rounding

** Comparative sample of Direct Support career ladders surveyed in 1986 (Includes AFSCs 552X2 and 611X0)

*** Less than 1 percent

TABLE 24

COMPARISON OF CURRENT SURVEY AND 1980 552X5 TAFMS GROUPS
(PERCENT MEMBERS RESPONDING POSITIVELY)

	1-48 MONTHS TAFMS		49-96 MONTHS TAFMS		97+ MONTHS TAFMS	
	1987 (N=660)	1980 (N=572)	1987 (N=226)	1980 (N=172)	1987 (N=354)	1980 (N=305)
<u>JOB SATISFACTION INFORMATION:</u>						
JOB FAIRLY INTERESTING OR BETTER	75	70	79	74	82	79
TALENTS UTILIZED FAIRLY WELL OR BETTER	83	79	84	78	83	88
TRAINING UTILIZED FAIRLY WELL OR BETTER	88	81	81	80	83	87
FAVORABLY CONSIDERING REENLISTMENT	56	35	79	55	76	77

IMPLICATIONS

This survey was requested by training personnel to obtain current task and equipment data for their use in evaluation of current training programs. Review of the Specialty Training Standard (STS) indicated four elements that appear to lack support for retention due to low performance response to tasks keyed to those elements. Additionally, some tasks not keyed to any part of the STS require review for possible inclusion in the document. Comparison of survey data to the Plan of Instruction (POI) for the ABR course for the career ladder revealed that four units of instruction (23 hours of class time) included objectives which are not supported by survey data. Additionally, a series of tasks performed by sufficient numbers of first-term airmen and reflecting high TE ratings should also be reviewed for possible inclusion in the ABR course.

APPENDIX A

SELECTED REPRESENTATIVE TASKS PERFORMED
BY CAREER LADDER STRUCTURE GROUPS

TABLE 1

GROUP ID NUMBER AND TITLE: ST0060, PLUMBING PERSONNEL CLUSTER

GROUP SIZE: 1,233

PERCENT OF SAMPLE: 82%

AVERAGE MILITARY GRADE: E-4

PERCENT MILITARY: 84%

AVERAGE TAFMS: 60 MONTHS

PERCENT CIVILIAN: 16%

AVERAGE CIVILIAN TFCS: 146 MONTHS

AVERAGE TICF: 68 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
I471 OPEN CLOGGED SINK DRAINS	96
H344 CUT COPPER PIPES OR TUBING	92
H318 ASSEMBLE COPPER TUBING USING SWEAT SOLDERED FITTINGS	91
J608 INSTALL GATE VALVES	91
J605 INSTALL FAUCETS	91
H392 REAM PIPING	90
I583 REPLACE TOILET BOWLS	89
J645 REMOVE FAUCETS	89
I460 INSTALL TOILET BOWLS	88
H334 BEND TUBING BY HAND	88
H331 ASSEMBLE THREADED PIPE FITTINGS	88
I525 REMOVE TOILET BOWLS	88
H346 CUT GALVANIZED STEEL PIPES	86
H316 ASSEMBLE COPPER TUBING USING FLARED FITTINGS	86
H393 REAM TUBING	84
I461 INSTALL URINALS	84
J644 REMOVE FAUCET COMPONENTS	83
I584 REPLACE URINALS	82
J675 REPLACE FAUCET COMPONENTS	82
L783 LOCATE LEAKS IN WATER PIPES	81
J627 INSTALL WATER CLOSET TANK FLOAT VALVES	80
J689 REPLACE WATER CLOSET TANK FLUSH VALVES	80
H416 REPLACE LEAKING WATER PIPES	79
K704 CLEAN PIPE THREADING MACHINES	78
J688 REPLACE WATER CLOSET TANK FLUSH VALVE COMPONENTS	78
J624 INSTALL VALVES USING SWEAT SOLDERED CONNECTIONS	77
F228 MAKE GASKETS	75
H340 CUT BLACK IRON PIPES (STEEL)	74
J670 REPLACE ANGLE VALVES	72
I565 REPLACE DOMESTIC LAVATORIES	72
I449 INSTALL DOMESTIC LAVATORIES	71
I589 REPLACE WATER HEATERS	65
H414 REPLACE LAWN SPRINKLER HEADS	56

TABLE I-A

GROUP ID NUMBER AND TITLE: ST0203, SENIOR GENERAL PLUMBERS

GROUP SIZE: 669

PERCENT OF SAMPLE: 45%

AVERAGE MILITARY GRADE: E-4

PERCENT MILITARY: 77%

AVERAGE TAFMS: 65 MONTHS

PERCENT CIVILIAN: 23%

AVERAGE CIVILIAN TFCS: 153 MONTHS

AVERAGE TICF: 82 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
I471 OPEN CLOGGED SINK DRAINS	98
H318 ASSEMBLE COPPER TUBING USING SWEAT SOLDERED FITTINGS	98
J605 INSTALL FAUCETS	97
I583 REPLACE TOILET BOWLS	97
I460 INSTALL TOILET BOWLS	97
H344 CUT COPPER PIPES OR TUBING	96
H316 ASSEMBLE COPPER TUBING USING FLARED FITTINGS	96
H392 REAM PIPING	96
H346 CUT GALVANIZED STEEL PIPES	95
H331 ASSEMBLE THREADED PIPE FITTINGS	95
J599 INSTALL ANGLE VALVES	94
J675 REPLACE FAUCET COMPONENTS	93
J689 REPLACE WATER CLOSET TANK FLUSH VALVES	93
L783 LOCATE LEAKS IN WATER PIPES	91
J688 REPLACE WATER CLOSET TANK FLUSH VALVE COMPONENTS	91
H333 BACKFILL TRENCHES	90
J670 REPLACE ANGLE VALVES	87
J614 INSTALL MIXING VALVES	86
I463 INSTALL WATER HEATERS	85
J601 INSTALL BALL VALVES	85
H320 ASSEMBLE FLANGED PIPES AND FITTINGS	84
J643 REMOVE CHECK VALVES	84
J674 REPLACE CHECK VALVES	83
G283 INSPECT PIPING FOR CORROSION	82
H355 CUT OPENINGS IN WOOD STRUCTURES FOR INSTALLATION OF PLUMBING USING POWER TOOLS	78
K697 CHANGE OIL IN THREADING MACHINES	78
H420 SWEDGE TUBING	78
J641 REMOVE BALL VALVES	77
J621 INSTALL VALVES USING FLANGED CONNECTIONS	77
H382 INSTALL SUMP PUMPS	73
H367 INSTALL BACKFLOW PREVENTORS	72
G265 INSPECT EXTERIOR WATER DISTRIBUTION SYSTEMS FOR LEAKS	69
J669 REPACK GLOBE VALVES	67

TABLE I-B

GROUP ID NUMBER AND TITLE: ST0205, JUNIOR GENERAL PLUMBERS

GROUP SIZE: 367

PERCENT OF SAMPLE: 25%

AVERAGE MILITARY GRADE: E-3

PERCENT MILITARY: 92%

AVERAGE TAFMS: 45 MONTHS

PERCENT CIVILIAN: 8%

AVERAGE CIVILIAN TFCS: 134 MONTHS

AVERAGE TICF: 44 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
I469 OPEN CLOGGED LAVATORIES	95
F209 CLEAN HANDTOOLS	94
H392 REAM PIPING	93
H344 CUT COPPER PIPES OR TUBING	93
J605 INSTALL FAUCETS	90
H318 ASSEMBLE COPPER TUBING USING SWEAT SOLDERED FITTINGS	89
H334 BEND TUBING BY HAND	87
H346 CUT GALVANIZED STEEL PIPES	86
I460 INSTALL TOILET BOWLS	85
J606 INSTALL FLUSHOMETER VALVES	84
J599 INSTALL ANGLE VALVES	82
H393 REAM TUBING	80
J675 REPLACE FAUCET COMPONENTS	79
I526 REMOVE URINALS	77
H416 REPLACE LEAKING WATER PIPES	77
H419 REPLACE TRAPS	77
H426 THREAD PIPES USING MOUNTED POWER THREADERS	77
J686 REPLACE WATER CLOSET TANK FLOAT VALVE COMPONENTS	76
L783 LOCATE LEAKS IN WATER PIPES	75
I584 REPLACE URINALS	75
J676 REPLACE FLUSHOMETER VALVE COMPONENTS	73
H333 BACKFILL TRENCHES	73
K704 CLEAN PIPE THREADING MACHINES	72
J609 INSTALL GLOBE VALVES	70
I565 REPLACE DOMESTIC LAVATORIES	66
J670 REPLACE ANGLE VALVES	66
I566 REPLACE DOMESTIC LAVATORY COMPONENTS	64
F217 DRAIN EXCAVATIONS USING BUCKETS OR CANS	64
H342 CUT CAST IRON PIPES	60
H340 CUT BLACK IRON PIPES (STEEL)	57
H330 ASSEMBLE SLIP JOINT CONNECTIONS	55
I589 REPLACE WATER HEATERS	55

TABLE I-C

GROUP ID NUMBER AND TITLE: ST0154, SUPERVISORY GENERAL PLUMBERS

GROUP SIZE: 13

PERCENT OF SAMPLE: 1%

AVERAGE MILITARY GRADE: E-6

PERCENT MILITARY: 100%

AVERAGE TAFMS: 163 MONTHS

PERCENT CIVILIAN: 0%

AVERAGE CIVILIAN TFCS: 0 MONTHS

AVERAGE TICF: 119 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
B74 SUPERVISE PLUMBING SPECIALISTS (AFSC 55255)	100
A1 ASSIGN PERSONNEL TO DUTY POSITIONS	100
B30 COUNSEL SUBORDINATES ON PERSONAL PROBLEMS	100
I470 OPEN CLOGGED SHOWER DRAINS	100
H426 THREAD PIPES USING MOUNTED POWER THREADERS	100
D109 CONDUCT OJT	92
A6 COORDINATE WORK REQUIREMENTS	92
A23 PLAN WORK ASSIGNMENTS	92
D125 MAINTAIN TRAINING RECORDS	92
E145 COORDINATE DIGGING PERMITS	92
J675 REPLACE FAUCET COMPONENTS	92
C104 WRITE APR	85
E134 ANNOTATE AF FORMS 1445 (MATERIALS AND EQUIPMENT LIST)	85
B47 DIRECT MAINTENANCE OF INTERIOR WATER DISTRIBUTION SYSTEMS	85
A18 FOLLOW-UP SUPPLY PROBLEMS	85
H378 ASSEMBLE COPPER TUBING USING SWEAT SOLDERED FITTINGS	85
J608 INSTALL GATE VALVES	85
L783 LOCATE LEAKS IN WATER PIPES	85
J605 INSTALL FAUCETS	85
J676 REPLACE FLUSHOMETER VALVE COMPONENTS	85
I525 REMOVE TOILET BOWLS	85
H346 CUT GALVANIZED STEEL PIPES	77
A29 SCHEDULE LEAVES OR PASSES	77
I460 INSTALL TOILET BOWLS	77
F228 MAKE GASKETS	77
A17 ESTABLISH WORK PRIORITIES	69
B71 SUPERVISE CIVILIAN PERSONNEL	69
I566 REPLACE DOMESTIC LAVATORY COMPONENTS	69
H392 REAM PIPING	69
E154 INVENTORY EQUIPMENT	69
H331 ASSEMBLE THREADED PIPE FITTINGS	62
B57 ESTABLISH BENCH STOCK LEVELS	62

TABLE I-D

GROUP ID NUMBER AND TITLE: STC175, PLUMBING INSTALLATION SPECIALISTS

GROUP SIZE: 33

PERCENT OF SAMPLE: 2%

AVERAGE MILITARY GRADE: E-4

PERCENT MILITARY: 76%

AVERAGE TAFMS: 67 MONTHS

PERCENT CIVILIAN: 24%

AVERAGE CIVILIAN TFCS: 50 MONTHS

AVERAGE TICF: 67 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
H344 CUT COPPER PIPES OR TUBING	100
J608 INSTALL GATE VALVES	100
H331 ASSEMBLE THREADED PIPE FITTINGS	97
I461 INSTALL URINALS	97
H391 MEASURE PIPE LENGTHS	94
H346 CUT GALVANIZED STEEL PIPES	94
H356 CUT PLASTIC PIPES OR TUBING	94
H385 LOWER PIPE INTO TRENCHES MANUALLY	94
H318 ASSEMBLE COPPER TUBING USING SWEAT SOLDERED FITTINGS	94
H384 INSTALL TRAPS	94
I460 INSTALL TOILET BOWLS	94
H355 CUT OPENINGS IN WOOD STRUCTURES FOR INSTALLATION OF PLUMBING USING POWER TOOLS	94
H378 INSTALL PLUMBING FIXTURES IN NEWLY CONSTRUCTED STRUCTURES	91
H392 REAM PIPING	91
H387 MEASURE GRADE OF PIPE LINES USING LEVELS	91
J605 INSTALL FAUCETS	91
H332 ATTACH PIPES TO BUILDING STRUCTURES	88
H426 THREAD PIPES USING MOUNTED POWER THREADERS	88
H425 THREAD PIPES USING HAND THREADERS	88
H340 CUT BLACK IRON PIPES (STEEL)	88
H316 ASSEMBLE COPPER TUBING USING FLARED FITTINGS	88
H379 INSTALL PLUMBING FIXTURES IN RENOVATED STRUCTURES	85
H393 REAM TUBING	85
H333 BACKFILL TRENCHES	85
H334 BEND TUBING BY HAND	85
H337 CALCULATE DESIRED FALL PER FOOT OF PIPING	82
I450 INSTALL DOMESTIC SINKS	82
I449 INSTALL DOMESTIC LAVATORIES	76
J599 INSTALL ANGLE VALVES	76
H353 CUT OPENINGS IN METAL STRUCTURES FOR INSTALLATION OF PLUMBING USING HANDTOOLS	70
F220 DRAIN EXCAVATIONS USING PORTABLE SUMP PUMPS	70
H314 ASSEMBLE CAST IRON NO HUB PIPES	67
K735 REPLACE DIES ON PIPE THREADING MACHINES	67

TABLE I-E

GROUP ID NUMBER AND TITLE: ST0085, SMART PERSONNEL

GROUP SIZE: 24

PERCENT OF SAMPLE: 2%

AVERAGE MILITARY GRADE: E-4

PERCENT MILITARY: 93%

AVERAGE TAFMS: 72 MONTHS

PERCENT CIVILIAN: 7%

AVERAGE CIVILIAN TFCS: 121 MONTHS

AVERAGE TICF: 66 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
I471 OPEN CLOGGED SINK DRAINS	95
I469 OPEN CLOGGED LAVATORIES	90
J645 REMOVE FAUCETS	90
I470 OPEN CLOGGED SHOWER DRAINS	90
I472 OPEN CLOGGED URINALS	85
J689 REPLACE WATER CLOSET TANK FLUSH VALVES	83
J688 REPLACE WATER CLOSET TANK FLUSH VALVE COMPONENTS	83
G284 INSPECT PLUMBING FIXTURES	78
J687 REPLACE WATER CLOSET TANK FLOAT VALVES	78
J675 REPLACE FAUCET COMPONENTS	75
F209 CLEAN HANDTOOLS	75
J646 REMOVE FLUSHOMETER VALVE COMPONENTS	73
J605 INSTALL FAUCETS	73
J644 REMOVE FAUCET COMPONENTS	73
J666 REMOVE WATER CLOSET TANK FLUSH VALVE COMPONENTS	73
J665 REMOVE WATER CLOSET TANK FLOAT VALVES	70
I583 REPLACE TOILET BOWLS	70
H318 ASSEMBLE COPPER TUBING USING SWEAT SOLDERED FITTINGS	70
J606 INSTALL FLUSHOMETER VALVES	65
J667 REMOVE WATER CLOSET TANK FLUSH VALVES	65
J599 INSTALL ANGLE VALVES	63
H419 REPLACE TRAPS	60
J627 INSTALL WATER CLOSET TANK FLOAT VALVES	60
I525 REMOVE TOILET BOWLS	60
H334 BEND TUBING BY HAND	60
J628 INSTALL WATER TANK FLUSH VALVES	55
I584 REPLACE URINALS	55
M833 OPEN CLOGGED OR RESTRICTED DRAINS USING VACUUM PRESSURE PLUNGERS	50
H405 REMOVE TRAPS	50
I566 REPLACE DOMESTIC LAVATORY COMPONENTS	50
H315 ASSEMBLE COPPER TUBING USING FERRULED FITTINGS	50
H344 CUT COPPER PIPES OR TUBING	50
H316 ASSEMBLE COPPER TUBING USING FLARED FITTINGS	50

TABLE II

GROUP ID NUMBER AND TITLE: ST0065, FIRE SUPPRESSION SYSTEMS PERSONNEL	
GROUP SIZE: 24	PERCENT OF SAMPLE: 2%
AVERAGE MILITARY GRADE: E-4	PERCENT MILITARY: 42%
AVERAGE TAFMS: 69 MONTHS	PERCENT CIVILIAN: 58%
AVERAGE CIVILIAN TFCS: 106 MONTHS	AVERAGE TICF: 92 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
N915 RESET WET PIPE FIRE SUPPRESSION SYSTEMS	96
N869 IDENTIFY FIRE SUPPRESSION SYSTEMS PIPING	96
G303 TEST INTERIOR FIRE SUPPRESSION SYSTEMS FOR FLOW	92
N881 PERFORM LOCAL ALARM DEVICE CHECKS	92
N907 RESET CLAPPER VALVE ON INTERIOR FIRE SUPPRESSION SYSTEMS	92
N919 TROUBLESHOOT MALFUNCTIONS TO DEFECTIVE WATER GONG ALARMS	92
N905 REPLACE STAND PIPE FIRE SUPPRESSION SYSTEM COMPONENTS	92
G302 TEST INTERIOR FIRE SUPPRESSION SYSTEMS FOR ALARM OPERATION	88
N895 REMOVE WET PIPE FIRE SUPPRESSION SYSTEM COMPONENTS	88
H375 INSTALL INTERIOR FIRE SUPPRESSION SYSTEM HEADS OR NOZZLES	88
N862 EXTEND DRY PIPE FIRE SUPPRESSION SYSTEMS	88
N900 REPLACE DRY PIPE FIRE SUPPRESSION SYSTEM COMPONENTS	88
N906 REPLACE WET PIPE FIRE SUPPRESSION SYSTEM COMPONENTS	83
N920 TROUBLESHOOT PRESSURE MALFUNCTIONS	83
N898 REPLACE DELUGE FIRE SUPPRESSION SYSTEM COMPONENTS	83
N888 REMOVE DELUGE FIRE SUPPRESSION SYSTEM COMPONENTS	79
J596 CLEAN CHECK VALVES	79
G262 INSPECT DRY PIPE FIRE SUPPRESSION SYSTEMS	75
G268 INSPECT FIRE SUPPRESSION SYSTEM HEAT ACTUATING DEVICES	75
H392 REAM PIPING	75
J603 INSTALL CHECK VALVES	75
K753 VISUALLY CHECK AIR COMPRESSOR BELTS FOR WEAR	75
H331 ASSEMBLE THREADED PIPE FITTINGS	71
H340 CUT BLACK IRON PIPES (STEEL)	71
N896 REPLACE AIR DRYER COMPONENTS	71
H361 DISASSEMBLE THREADED PIPE FITTINGS	71
H425 THREAD PIPES USING HAND THREADERS	71
K711 FLUSH PIPES	67
N851 CALCULATE WATER FLOW OF FIRE SUPPRESSION SYSTEMS	67
J615 INSTALL OUTSIDE SCREW AND YOKE (OS&Y) VALVES	67
N877 INSTALL WET PIPE FIRE SUPPRESSION SYSTEMS	63
N880 PERFORM FIRE PUMP TESTS	63
N903 REPLACE HEAT ACTUATING DEVICES	63
F228 MAKE GASKETS	63

TABLE III

GROUP ID NUMBER AND TITLE: ST0243, RED HORSE PERSONNEL

GROUP SIZE: 6

PERCENT OF SAMPLE: .4%

AVERAGE MILITARY GRADE: E-4

PERCENT MILITARY: 100%

AVERAGE TAFMS: 75 MONTHS

PERCENT CIVILIAN: 0%

AVERAGE CIVILIAN TFCS: 0 MONTHS

AVERAGE TICF: 42 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
S1075 FIRE M-16 RIFLES	100
H344 CUT COPPER PIPES OR TUBING	100
F213 CLEAN UP JOB SITES	100
H333 BACKFILL TRENCHES	100
S1111 PERFORM INDIVIDUAL MOVEMENT TECHNIQUES FOR WORK PARTY SECURITY	100
F227 LUBRICATE HANDTOOLS	100
H346 CUT GALVANIZED STEEL PIPES	100
F218 DRAIN EXCAVATIONS USING CENTRIFUGAL PUMPS	100
F219 DRAIN EXCAVATIONS USING DIAPHRAM PUMPS	100
H391 MEASURE PIPE LENGTHS	83
H425 THREAD PIPES USING HAND THREADERS	83
S1084 OPERATE CARGO TRUCKS	83
H331 ASSEMBLE THREADED PIPE FITTINGS	83
H392 REAM PIPING	83
H385 LOWER PIPE INTO TRENCHES MANUALLY	83
S1071 ERECT PORTABLE SHOWERS	83
S1112 PERFORM MILITARY FIELD SANITATION TECHNIQUES	83
I460 INSTALL TOILET BOWLS	83
H347 CUT OPENINGS IN CONCRETE STRUCTURES FOR INSTALLATION OF PLUMBING USING HANDTOOLS	83
H393 REAM TUBING	83
F217 DRAIN EXCAVATIONS USING BUCKETS OR CANS	83
H337 CALCULATE DESIRED FALL PER FOOT OF PIPING	83
J599 INSTALL ANGLE VALVES	83
J603 INSTALL CHECK VALVES	83
H362 FINISH GRADE TRENCHES BY HAND SHOVEL	67
E156 INVENTORY TOOLS	67
H356 CUT PLASTIC PIPES OR TUBING	67
H332 ATTACH PIPES TO BUILDING STRUCTURES	67
H318 ASSEMBLE COPPER TUBING USING SWEAT SOLDERED FITTINGS	67
S1074 FIRE .38 CALIBER PISTOLS	67
K704 CLEAN PIPE THREADING MACHINES	67
F228 MAKE GASKETS	67
S1106 PERFORM CRATER DAMAGE REPAIR	50

TABLE IV

GROUP ID NUMBER AND TITLE: ST0034, SUPERVISORY PERSONNEL CLUSTER	
GROUP SIZE: 109	PERCENT OF SAMPLE: 7%
AVERAGE MILITARY GRADE: E-6	PERCENT MILITARY: 75%
AVERAGE TAFMS: 174 MONTHS	PERCENT CIVILIAN: 25%
AVERAGE CIVILIAN TFCS: 221 MONTHS	AVERAGE TICF: 168 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
B30 COUNSEL SUBORDINATES ON PERSONAL PROBLEMS	92
C104 WRITE APR	90
A7 COORDINATE WORK SCHEDULES WITH WORK CONTROL SECTIONS	87
A23 PLAN WORK ASSIGNMENTS	86
A17 ESTABLISH WORK PRIORITIES	85
A29 SCHEDULE LEAVES OR PASSES	83
A16 ESTABLISH REQUIREMENTS FOR SUPPLIES	81
B68 INTERPRET POLICIES, DIRECTIVES, OR PROCEDURES FOR SUBORDINATES	80
B74 SUPERVISE PLUMBING SPECIALISTS (AFSC 55255)	76
E134 ANNOTATE AF FORMS 1445 (MATERIALS AND EQUIPMENT LIST)	76
A5 COORDINATE WORK PROGRAMS WITH STRUCTURAL SUPERINTENDENTS	75
A11 ESTABLISH REQUIREMENTS FOR EQUIPMENT	71
C99 INDORSE AIRMAN PERFORMANCE REPORTS (APR)	70
A10 ESTABLISH PERFORMANCE STANDARDS	68
B57 ESTABLISH BENCH STOCK LEVELS	67
D125 MAINTAIN TRAINING RECORDS	65
A14 ESTABLISH REQUIREMENTS FOR PERSONNEL	65
B70 SUPERVISE APPRENTICE PLUMBING SPECIALISTS (AFSC 55235)	64
B71 SUPERVISE CIVILIAN PERSONNEL	63
A9 ESTABLISH OFFICE INSTRUCTIONS (OI) OR STANDING OPERATING PROCEDURES (SOP)	62
E185 REVIEW AF FORMS 1879 (BCE JOB ORDER RECORD) TO DETERMINE JOB REQUIREMENTS	61
A19 PLAN BRIEFINGS	56
E189 REVIEW COMMERCIAL PUBLICATIONS TO DETERMINE HOW TO ORDER SUPPLIES AND EQUIPMENT	56
D109 CONDUCT OJT	55
D121 EVALUATE OJT TRAINEES	55
E192 REVIEW ENGINEERING DRAWINGS OR SPECIFICATIONS TO DETERMINE PLUMBING INSTALLATION METHODS	55
C97 EVALUATE WORKING DRAWINGS	54
B75 SUPERVISE PLUMBING TECHNICIANS (AFSC 55275)	50

TABLE IV-A

GROUP ID NUMBER AND TITLE: ST0086, NCOICs AND SHOP FOREMEN

GROUP SIZE: 84

PERCENT OF SAMPLE: 6%

AVERAGE MILITARY GRADE: E-6

PERCENT MILITARY: 70%

AVERAGE TAFMS: 182 MONTHS

PERCENT CIVILIAN: 30%

AVERAGE CIVILIAN TFCS: 214 MONTHS

AVERAGE TICF: 183 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
B31 COUNSEL SUBORDINATES ON WORK PROGRESS	94
C104 WRITE APR	93
A17 ESTABLISH WORK PRIORITIES	92
A7 COORDINATE WORK SCHEDULES WITH WORK CONTROL SECTIONS	92
A29 SCHEDULE LEAVES OR PASSES	88
B68 INTERPRET POLICIES, DIRECTIVES, OR PROCEDURES FOR SUBORDINATES	87
B74 SUPERVISE PLUMBING SPECIALISTS (AFSC 55255)	86
A16 ESTABLISH REQUIREMENTS FOR SUPPLIES	86
A5 COORDINATE WORK PROGRAMS WITH STRUCTURAL SUPERINTENDENTS	85
A10 ESTABLISH PERFORMANCE STANDARDS	80
A11 ESTABLISH REQUIREMENTS FOR EQUIPMENT	79
A12 ESTABLISH REQUIREMENTS FOR MAINTENANCE OF EQUIPMENT	79
E155 INVENTORY SUPPLIES	77
C99 INDORSE AIRMAN PERFORMANCE REPORTS (APR)	76
B71 SUPERVISE CIVILIAN PERSONNEL	74
B70 SUPERVISE APPRENTICE PLUMBING SPECIALISTS (AFSC 55235)	74
E185 REVIEW AF FORMS 1879 (BCE JOB ORDER RECORD) TO DETERMINE JOB REQUIREMENTS	73
B57 ESTABLISH BENCH STOCK LEVELS	73
C98 EVALUATE WORKLOAD REQUIREMENTS	71
E197 REVIEW WORKING DRAWINGS TO DETERMINE PLUMBING INSTALLATION METHODS	71
D125 MAINTAIN TRAINING RECORDS	70
A9 ESTABLISH OFFICE INSTRUCTIONS (OI) OR STANDING OPERATING PROCEDURES (SOP)	70
D109 CONDUCT OJT	67
B75 SUPERVISE PLUMBING TECHNICIANS (AFSC 55275)	63
E186 REVIEW AF FORMS 327 (BASE CIVIL ENGINEER WORK ORDER) TO DETERMINE JOB REQUIREMENTS	61
E148 DRAFT CORRESPONDENCE	60
C105 WRITE CIVILIAN PERFORMANCE AND PROMOTION APPRAISALS	57
D118 DIRECT TRAINING PROGRAMS	56

TABLE IV-B

GROUP ID NUMBER AND TITLE: ST0178, SMART CREW SUPERVISORS

GROUP SIZE: 10

PERCENT OF SAMPLE: .6%

AVERAGE MILITARY GRADE: E-6

PERCENT MILITARY: 100%

AVERAGE TAFMS: 155 MONTHS

PERCENT CIVILIAN: 0%

AVERAGE CIVILIAN TFCS: 0 MONTHS

AVERAGE TICF: 119 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
B72 SUPERVISE MILITARY PERSONNEL IN AFSC OTHER THAN 552X5	100
E161 PREPARE AF FORMS 1219 (BCE MULTI-CRAFT JOB ORDER)	100
A23 PLAN WORK ASSIGNMENTS	100
A18 FOLLOW-UP SUPPLY PROBLEMS	100
B31 COUNSEL SUBORDINATES ON WORK PROGRESS	100
B54 DIRECT STRUCTURAL MAINTENANCE AND REPAIR TEAM (SMART) PERSONNEL	90
B74 SUPERVISE PLUMBING SPECIALISTS (AFSC 55255)	90
C79 EVALUATE BENCH STOCK LISTS	90
A16 ESTABLISH REQUIREMENTS FOR SUPPLIES	90
A7 COORDINATE WORK SCHEDULES WITH WORK CONTROL SECTIONS	90
B30 COUNSEL SUBORDINATES ON PERSONAL PROBLEMS	90
A29 SCHEDULE LEAVES OR PASSES	90
E155 INVENTORY SUPPLIES	80
E134 ANNOTATE AF FORMS 1445 (MATERIALS AND EQUIPMENT LIST)	80
A17 ESTABLISH WORK PRIORITIES	80
A6 COORDINATE WORK REQUIREMENTS	80
C104 WRITE APR	80
E195 REVIEW SMART JOB ORDERS	70
E156 INVENTORY TOOLS	70
A13 ESTABLISH REQUIREMENTS FOR MAINTENANCE OF FACILITIES	70
B68 INTERPRET POLICIES, DIRECTIVES, OR PROCEDURES FOR SUBORDINATES	70
D125 MAINTAIN TRAINING RECORDS	70
G284 INSPECT PLUMBING FIXTURES	60
C96 EVALUATE WORK SCHEDULES	60
C103 PREPARE INSPECTION SCHEDULES	60
E154 INVENTORY EQUIPMENT	60
B57 ESTABLISH BENCH STOCK LEVELS	60
C99 INDORSE AIRMAN PERFORMANCE REPORTS (APR)	60
A1 ASSIGN PERSONNEL TO DUTY POSITIONS	50
A5 COORDINATE WORK PROGRAMS WITH STRUCTURAL SUPERINTENDENTS	50
E153 INITIATE AF FORMS 1297 (TEMPORARY ISSUE RECEIPT)	50
E133 ANNOTATE AF FORMS 1255 (QUALITY CONTROL EVALUATION)	50

TABLE V

GROUP ID NUMBER AND TITLE: ST0025, TRAINING PERSONNEL

GROUP SIZE: 6

PERCENT OF SAMPLE: .4%

AVERAGE MILITARY GRADE: E-5

PERCENT MILITARY: 100%

AVERAGE TAFMS: 114 MONTHS

PERCENT CIVILIAN: 0%

AVERAGE CIVILIAN TFCs: 0 MONTHS

AVERAGE TICF: 104 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
D106 ADMINISTER TESTS	100
D130 SCORE TESTS	83
D127 PREPARE LESSON PLANS	83
D110 CONDUCT REMEDIAL TRAINING	83
E156 INVENTORY TOOLS	67
D129 PREPARE TRAINING AIDS	67
E138 ASSIGN TOOL BOXES TO INDIVIDUALS	50
D111 CONDUCT RESIDENT COURSE TRAINING	50
D114 COUNSEL TRAINEES ON TRAINING PROBLEMS	50
D132 WRITE TEST QUESTIONS	50
N851 CALCULATE WATER FLOW OF FIRE SUPPRESSION SYSTEMS	50
N907 RESET CLAPPER VALVE ON INTERIOR FIRE SUPPRESSION SYSTEMS	50
N915 RESET WET PIPE FIRE SUPPRESSION SYSTEMS	50
N908 RESET DELUGE FIRE SUPPRESSION SYSTEMS	50
D115 DEVELOP CURRICULUM MATERIALS	50
E155 INVENTORY SUPPLIES	50
D122 EVALUATE RESIDENCE COURSE TRAINEES	33
D123 EVALUATE TRAINING PROGRAMS	33
J694 ADJUST PUMP IMPELLERS	33
K734 REPACK PUMPS	33
N880 PERFORM FIRE PUMP TESTS	33
N888 REMOVE DELUGE FIRE SUPPRESSION COMPONENTS	33
N890 REMOVE DRY PIPE FIRE SUPPRESSION SYSTEM COMPONENTS	33
N898 REPLACE DELUGE FIRE SUPPRESSION SYSTEM COMPONENTS	33
N900 REPLACE DRY PIPE FIRE SUPPRESSION SYSTEM COMPONENTS	33
N895 REMOVE WET PIPE FIRE SUPPRESSION SYSTEM COMPONENTS	33
N906 REPLACE WET PIPE FIRE SUPPRESSION SYSTEM COMPONENTS	33
F209 CLEAN HANDTOOLS	33
F228 MAKE GASKETS	33
H331 ASSEMBLE THREADED PIPE FITTINGS	33
H344 CUT COPPER PIPES OR TUBING	33
H346 CUT GALVANIZED STEEL PIPES	33
H361 DISASSEMBLE THREADED PIPE FITTINGS	33

TABLE VI

GROUP ID NUMBER AND TITLE: ST0093, PLANNERS

GROUP SIZE: 29

AVERAGE MILITARY GRADE: E-5

AVERAGE TAFMS: 172 MONTHS

AVERAGE CIVILIAN TFCS: 0 MONTHS

PERCENT OF SAMPLE: 2%

PERCENT MILITARY: 100%

PERCENT CIVILIAN: 0%

AVERAGE TICF: 142 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
A27 PREPARE WORKING DRAWINGS FOR PLUMBING INSTALLATIONS	93
E134 ANNOTATE AF FORMS 1445 (MATERIALS AND EQUIPMENT LIST)	90
E192 REVIEW ENGINEERING DRAWINGS OR SPECIFICATIONS TO DETERMINE PLUMBING INSTALLATION METHODS	90
E197 REVIEW WORKING DRAWINGS TO DETERMINE PLUMBING INSTALLATION METHODS	86
E145 COORDINATE DIGGING PERMITS	86
A20 PLAN LAYOUTS OF PLUMBING FACILITIES	79
E175 PREPARE COST ESTIMATES FOR IN-SERVICE WORK REQUESTS	76
E189 REVIEW COMMERCIAL PUBLICATIONS TO DETERMINE HOW TO ORDER SUPPLIES AND EQUIPMENT	72
E185 REVIEW AF FORMS 1879 (BCE JOB ORDER RECORD) TO DETERMINE JOB REQUIREMENTS	69
C102 PERFORM FACILITY SURVEYS	66
E186 REVIEW AF FORMS 327 (BASE CIVIL ENGINEER WORK ORDER) TO DETERMINE JOB REQUIREMENTS	62
A6 COORDINATE WORK REQUIREMENTS	59
E190 REVIEW COMMERCIAL PUBLICATIONS TO DETERMINE INSTALLATION METHODS	52
E198 UPDATE AF FORMS 103 (BASE CIVIL ENGINEER WORK CLEARANCE REQUEST)	52
C97 EVALUATE WORKING DRAWINGS	48
E165 PREPARE AF FORMS 332 (BCE WORK REQUEST)	48
G284 INSPECT PLUMBING FIXTURES	45
E136 ANNOTATE CHANGES IN EQUIPMENT LAYOUT ON BLUEPRINTS	41
ST068 ERECT HARD BACK TENTS	41
C86 EVALUATE LAYOUT OF FACILITIES	34
A18 FOLLOW-UP SUPPLY PROBLEMS	34
G275 INSPECT INSTALLATIONS TO ESTABLISH WORK REQUIREMENTS	31
E150 DRAFT WORK ORDERS FOR CIVIL ENGINEERING SUPPORT	31

TABLE VII

GROUP ID NUMBER AND TITLE: ST0146, PRIME BEEF TEAM MEMBERS

GROUP SIZE: 6

PERCENT OF SAMPLE: .4%

AVERAGE MILITARY GRADE: E-6

PERCENT MILITARY: 100%

AVERAGE TAFMS: 167 MONTHS

PERCENT CIVILIAN: 0%

AVERAGE CIVILIAN TFCS: 0 MONTHS

AVERAGE TICF: 159 MONTHS

The following are in descending order by percent members performing:

REPRESENTATIVE TASKS	PERCENT MEMBERS PERFORMING
S1075 FIRE M-16 RIFLES	100
S1068 ERECT HARD BACK TENTS	100
S1072 ERECT TENTS	100
S1111 PERFORM INDIVIDUAL MOVEMENT TECHNIQUES FOR WORK PARTY SECURITY	100
S1052 ASSEMBLE AND TOW AM-2 MATTING FOR RAPID RUNWAY REPAIR	100
S1058 CONSTRUCT FIELD FORTIFICATIONS	100
S1112 PERFORM MILITARY FIELD SANITATION TECHNIQUES	83
S1084 OPERATE CARGO TRUCKS	83
S1109 PERFORM EXPLOSIVE ORDNANCE RECONNAISSANCE	83
S1104 PERFORM CAMP CANTONMENT CONSTRUCTION TECHNIQUES	83
S1105 PERFORM COVER AND CONCEALMENT TECHNIQUES FOR WORK PARTY SECURITY	83
S1051 ANCHOR AM-2 MATTING	83
S1103 PALLETIZE CONTINGENCY EQUIPMENT	67
S1074 FIRE .38 CALIBER PISTOLS	67
S1073 ESTABLISH FIELD LATRINE SITES	67
S1070 ERECT PORTABLE LATRINES	67
S1071 ERECT PORTABLE SHOWERS	67
S1106 PERFORM CRATER DAMAGE REPAIR	67
S1126 SET UP FIELD WATER HEATERS	67
S1067 ERECT FIELD ERDLATORS	67
B55 DIRECT SUPPORT OF PRIME BEEF OPERATIONS	50
A6 COORDINATE WORK REQUIREMENTS	50
S1091 OPERATE FORKLIFTS	50
S1069 ERECT MOBILE TACTICAL CENTERS	50
S1076 IDENTIFY CHEMICAL WARFARE AGENTS	50
S1102 PACK CONTINGENCY EQUIPMENT	50
S1100 OPERATE TENT HEATERS	50
S1066 ERECT CAMOUFLAGE NETTING	50
S1093 OPERATE IMMERSION HEATERS	50
S1125 SET UP FIELD WATER DISTRIBUTION SYSTEMS	50
S1080 LAY AM-2 MATTING FOR AIRCRAFT PARKING REVETMENTS	50

APPENDIX B

TABLES DISPLAYING DATA PERTAINING TO
SPECIFIC BACKGROUND QUESTIONS

TABLE B1

MILITARY PERSONNEL COMPLETING PRE-USAF VOCATIONAL TRAINING
(PERCENT RESPONDING YES)

QUESTION	1ST JOB (N=284)	1ST ENL (N=660)	DAFSC 55255 (N=785)	DAFSC 55275 (N=223)	TOTAL SAMPLE (N=1,240)
BEFORE ENLISTING IN THE AIR FORCE, DID YOU COMPLETE A VOCATIONAL TRAINING PROGRAM IN PLUMBING, SUCH AS A 4-YEAR HIGH SCHOOL TECHNICAL PROGRAM, ACCREDITED VOCATIONAL SCHOOL, OR A JUNIOR COLLEGE PROGRAM?	6	4	6	4	5

TABLE B2

MILITARY PERSONNEL WITH PRIOR CIVILIAN PLUMBING EXPERIENCE
(PERCENT RESPONDING YES)

QUESTION	1ST JOB (N=284)	1ST ENL (N=660)	DAFSC 55255 (N=785)	DAFSC 55275 (N=223)	TOTAL SAMPLE (N=1,240)
BEFORE ENLISTING IN THE AIR FORCE, DID YOU EVER HOLD A FULL TIME JOB (AT LEAST SIX MONTHS) AS A PLUMBER OR PLUMBER HELPER?	11	10	11	12	11

TABLE B3

PLUMBING REFERENCES USED IN PRESENT JOB
(PERCENT MEMBERS RESPONDING)

PLUMBING REFERENCE	1ST JOB (N=284)	1ST ENL (N=660)	DAFSC 55255 (N=785)	DAFSC 55275 (N=223)
AFM 50-23, On-the-Job Training (PA)	39	31	31	51
AFM 67-23, Standard Base System Customer's Guide	2	2	3	12
AFM 85-20, Plumbing	30	28	32	60
AFM 85-21, Operation and Maintenance of Cross-Connection Control and Backflow Prevention System	13	15	21	43
AFM 85-50, Pipefitting, Plumbing Handbook	7	8	11	27
AFM 85-59, Preventive/Recurring Maintenance Handbook	12	12	15	30
AFM 91-6, Maintenance and Operation of Gas Systems	6	6	8	17
AFM 91-26, Real Property Operation and Maintenance	4	4	5	7
AFM 91-32, Operation and Maintenance of Domestic and Industrial Waste Water Systems	6	5	6	9
AFM 91-37, Maintenance of Fire Protection Systems	10	12	17	33
AFM 127-12, AF Occupational Safety and Health Program	7	9	16	39
AFOS 127-12, Occupational Safety-Machinery	8	8	10	21
AFTO 40P-1-131, Plumbing and Pipefitting	12	10	9	14
CDC Manual for AFSC 552X5	42	38	39	50
Major Command Engineering Manual	1	1	2	2
National Fire Protection Handbook	4	7	10	27
National Standard Plumbing Code	8	10	16	37
State Plumbing Code	5	7	9	14
Uniform Plumbing Code	7	11	14	19
None used - present job	23	29	28	16

TABLE B4

FORMAL TECHNICAL TRAINING COURSES COMPLETED
(PERCENT MEMBERS RESPONDING)

COURSES	DAFSC 55235 (N=232)	DAFSC 55255 (N=785)	DAFSC 55275 (N=223)	CIVILIANS (N=257)
3ABR55235-000, PLUMBING SPECIALIST	71	79	76	24
J3AZR55255-000, FIRE SUPPRESSION SYSTEM MAINTENANCE	9	23	32	24
J3AZR55255-001, BACKFLOW PREVENTION DEVICE TESTING	9	27	39	33
J3AZR55255-002, NATURAL GAS DISTRI- BUTION SYSTEMS MAINTENANCE	7	16	22	24
J4AST55255-001, NATURAL GAS DISTRI- BUTION SYSTEMS MAINTENANCE, MOBILE	2	6	10	7

TABLE B5

MILITARY PERSONNEL ASSIGNED TO A RED HORSE UNIT
(PERCENT RESPONDING YES)

QUESTION	1ST JOB (N=284)	1ST ENL (N=660)	DAFSC 55255 (N=785)	DAFSC 55275 (N=223)	TOTAL SAMPLE (N=1,240)
ARE YOU A MEMBER OF RED HORSE?	5	4	4	5	5

TABLE B6

PERSONNEL POSSESSING MILITARY DRIVER LICENSE, FLIGHTLINE CONTROL BADGE,
AREA CONTROL BADGE, OR SECURITY CLEARANCE
(PERCENT MEMBERS RESPONDING YES)

QUESTIONS	MAJCOM									
	SAC (N=310)	TAC (N=192)	MAC (N=152)	ATC (N=124)	AFLC (N=98)	AFSC (N=49)	SPOCNU (N=28)	PACAF (N=106)	USAFE (N=103)	AAC (N=37)
DO YOU POSSESS A MILITARY DRIVER'S LICENSE?	95	95	94	97	95	94	93	95	92	95
DO YOU POSSESS A FLIGHTLINE BADGE?	52	11	28	11	40	41	7	17	50	24
DO YOU POSSESS AN AREA CONTROL BADGE?	62	11	26	15	81	39	89	25	59	32
DO YOU POSSESS A SECURITY CLEARANCE?	90	76	82	82	80	80	86	82	83	76

TABLE B7

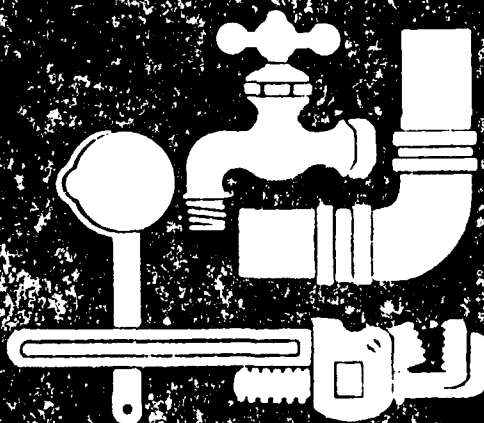
TIME SPENT ON TRAINING, ADDITIONAL DUTIES, OR DETAILS EACH MONTH
(PERCENT MEMBERS RESPONDING)

NUMBER OF HOURS	MAJCOM									
	SAC (N=310)	TAC (N=192)	MAC (N=152)	ATC (N=124)	AFLC (N=98)	AFSC (N=49)	SPCCMD (N=28)	PACAF (N=106)	USAFE (N=103)	AAC (N=37)
RECEIVING AND PARTICIPATING IN TRAINING										
NO TRAINING	4	3	4	0	3	0	11	2	1	0
1 TO 8 HOURS MONTHLY	30	24	32	35	23	43	18	28	21	32
9 TO 16 HOURS MONTHLY	19	15	8	15	14	10	14	17	26	14
17 TO 24 HOURS MONTHLY	10	9	8	7	9	2	25	7	8	11
25 TO 32 HOURS MONTHLY	4	8	8	2	2	0	0	7	1	5
33 TO 40 HOURS MONTHLY	7	4	4	5	1	4	7	4	5	0
OVER 40 HOURS MONTHLY	8	19	18	8	20	10	7	6	11	6
NO RESPONSE	18	18	18	27	28	31	18	29	27	32
ADDITIONAL DUTIES OR DETAILS										
NO TIME SPENT	2	1	0	0	0	6	4	2	0	0
1 TO 8 HOURS MONTHLY	32	28	41	39	40	35	21	27	28	35
9 TO 16 HOURS MONTHLY	28	21	14	15	24	12	21	24	20	19
17 TO 24 HOURS MONTHLY	13	17	13	13	5	2	11	18	12	19
25 TO 32 HOURS MONTHLY	5	9	7	8	5	8	7	3	3	8
33 TO 40 HOURS MONTHLY	4	5	1	5	3	6	0	5	14	3
OVER 40 HOURS MONTHLY	4	6	4	5	5	9	22	4	7	0
NO RESPONSE	12	13	20	15	18	22	14	17	16	16

APPENDIX C

JOB GRADING STANDARDS FOR PLUMBER
(SERIES WG-4206)

JOB GRADING STANDARD FOR
PLUMBER WG-4206



U.S. CIVIL SERVICE COMMISSION

TS-6 MARCH 1969

FPM SUPPLEMENT 512-1



COVERAGE OF STANDARD

This standard is used to grade all nonsupervisory jobs involved in the installation, modification, and repair of utility, supply, and disposal systems, fixtures, fittings, and equipment such as sewage, water, gas, and oil lines, compressed air, vacuum, and acid systems, water closets, water heaters, hydrants, valves, and pumps.

JOBS NOT COVERED BY THIS STANDARD

Jobs that involve installing and repairing steam and high-pressure hot water and fuel distribution systems, or installing pipe insulation materials, as a primary assignment, are not covered by this standard.

TITLES

Jobs covered by this standard below the WG 9 level are to be titled *Plumbing Worker*.

Jobs covered by this standard at the WG 9 level and above are to be titled *Plumber*.

GRADE LEVELS

This standard does not describe all possible levels at which jobs might be established. If jobs differ substantially from the skill, knowledge, and other work requirements described in the grade levels of the standard, they may warrant grading either above or below those grades.

HELPER AND INTERMEDIATE JOBS

Jobs that are part of a planned program of training and development for advancement to a higher grade are graded by the U.S. Civil Service Commission job grading standards for Trades Helper and Intermediate Jobs. (WG-9 in this standard is to be used as the "journeyman grade" in applying the Intermediate Job Grading Table.)

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General: The work at this grade involves making repairs that can be accomplished by removing, cleaning, replacing, packing, and sealing defective parts of utility, supply, and disposal systems such as dirty traps, sections of broken tile pipe, and leaky drains.

The WG-7 plumbing worker receives work orders, oral instructions, and sketches that provide specific information on the work to be done, for example, where the work is to be done, the kind of repair to be made, and the materials that will be needed. He completes needed repairs like those described above, and hooks up to installed systems such things as water heaters, disposal units, and faucets.

Skill and Knowledge: At this grade, the plumbing worker must have a knowledge of standard plumbing methods and techniques. For example, he must know how to measure, cut, bend, and thread pipe and tile, and how to caulk and seal such things as elbows, union joints, tile pipe, faucets, and shower drains. The plumbing worker must have the skill needed to remove, clean, reinstall, or replace joints and fixtures, for example, traps, faucets, and unions. He must also have the skill needed to hook up equipment (for example, water heaters and disposal units) to installed systems, and replace sections of pipe and tile by following previously-used routes, hangers, and levels. The plumbing worker must have the ability to add, subtract, multiply, divide, and work with simple fractions. He must have skill in the use of tools and equipment such as tapes, rules, hacksaws, hand and power pipe threaders and cutters, packing and caulking irons, and pipe wrenches.

Responsibility: A higher grade worker or supervisor assigns work orally or through work orders and sketches. The plumbing worker selects tools, decides on methods and techniques to use, and carries out the work with little check during its progress. He uses materials that are specified in work orders, or obtains replacement parts, such as unions, traps, and elbows, by comparison with samples. He also measures, cuts, bends, and threads pipe and tile according to measurements specified in work orders or sketches, or by measurements taken from samples. The plumbing worker installs equipment, such as water heaters and disposal units, and replaces sections of pipe and tile by following exactly previously used routes, openings, hangers, and levels and reconnecting equipment units to already-installed systems. A higher grade worker or

JOB GRADING SYSTEM

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WG-4206-7

the supervisor gives advice on unusual problems, and checks to see that completed work meets requirements.

Physical Effort: The plumbing worker makes repairs and installations from ladders, scaffolding, and platforms, and where the parts of systems worked on are in hard-to-reach places. This requires him to stand, stoop, bend, kneel, climb, and work in tiring and uncomfortable positions. The plumbing worker frequently lifts, carries, and sets up parts and equipment that weigh up to 40 pounds.

Working Conditions: The work is done inside and outside, and is usually dirty, dusty, and greasy. The plumbing worker is sometimes required to make repairs and installations outside in bad weather. He occasionally makes repairs in areas where bad smelling fumes are present. The plumbing worker has occasional exposure to the possibility of broken bones. He has frequent exposure to the possibility of scrapes, burns, and infections.

WG-4206-9

Plumber, WG-9

WG-4206-9

General: The work at this grade involves installing, modifying, and repairing new and existing utility, supply, and disposal systems and equipment such as sewage, water, oil, and gas distribution systems, and water closets, tubs, fire sprinkler systems, and showers. The WG-9 plumber works from building plans, blueprints, and sketches to plan and lay out the routing, placement, slant, slope, fall, and proper operation of systems and equipment. He installs, modifies, and repairs systems like those described above by locating and tapping main lines, setting up system routes, placing and cutting route openings, placing hangers for proper level and slope, and determining and installing valves, traps, and unions needed for proper operation of systems. He also installs equipment like that described above by completing the routing and placement of systems leading to the equipment, and seating, hooking up, and testing the equipment.

In comparison with the plumbing worker at WG-7, the plumber at WG-9 must have a greater knowledge of the operation of various systems and equipment, and of how they are placed, slanted, and sloped. The WG-9 plumber also has greater responsibility than the WG-7 plumbing worker for the planning, layout, and completion of installations, modifications, and repairs by the other workers. The supervisor checks work only to see that the standards are met.

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Skill and Knowledge: At this grade, the plumber must have a knowledge of how various supply, disposal, and utility systems and equipment, such as water and gas systems, fire sprinkler equipment, and water closets, are installed and operate. He must have the ability to plan and lay out the installation and modification of various systems and equipment, for example, the routing, openings, slant, and level of gas and water lines, and the location and arrangement of water closets, sinks, and fire sprinkler equipment. The plumber must have the ability to interpret and apply building plans and blueprints, use shop mathematics, and lay out such things as angles, arcs, and circles. He must have skill in the use of any of the accepted trade methods and techniques, such as wiping and pouring lead joints, seating equipment, and installing any combinations of couplings, unions, and joints needed for the proper operation of the systems. He must also have skill in the use of tools and equipment such as plumb bobs, mercury gauges, dividers, closet augers, hydrostatic pumps, and lead pots.

Responsibility: The supervisor assigns work orally, and through work orders, building plans, and blueprints. The plumber plans and lays out the needed routing, placement, slant, slope, and fall of systems. He determines that parts (for example, pipe, reduction couplings, elbows, traps, and valves) are the proper kind and size. He completes installations, modifications, and repairs with little or no check during their progress or upon completion. The plumber tests and makes needed adjustments to systems and equipment, after completing the work, for proper operation, flow, drainage, and sanitary conditions. The supervisor checks his overall work to see that it meets accepted trade standards.

Physical Effort: Physical effort at this grade is the same as that described at WG-7.

Working Conditions: Working conditions at this grade are the same as those described at WG-7.

U.S. GOVERNMENT PRINTING OFFICE: 1969 O - 331 007

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20540

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March 1969

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